INSTRUCTIONS

Thank you for purchasing the JVC Compact VHS camcorder. Learn about all the available features and take advantage of them for your total moviemaking enjoyment. Before using this camcorder, read this instruction booklet carefully so that you will obtain the best results from your camcorder.

SAFETY PRECAUTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK.
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

The AA-V11U AC Power Adapter/Charger should be used with:
AC 120 V~, 60 Hz in the USA and Canada,
AC 110 – 240 V~, 50/60 Hz in other countries.

CAUTION (applies to the AA-V11U)

TO PREVENT ELECTRIC SHOCK MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION (s'applique à l'AA-V11U)

POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

You are recommended to carefully read the cautions on pages 42 and 43 before use.

Warning on lithium battery

The battery used in this device may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, heat above 100°C (212°F) or incinerate.
Replace battery with CR2025; use of another battery may present a risk of fire or explosion.
- Dispose of used battery promptly.
- Keep away from children.
- Do not disassemble and do not dispose of in fire.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

NOTES:
- The rating plate (serial number plate) and safety caution are on the bottom and/or the back of the main unit.
- The rating plate (serial number plate) of the AC Power Adapter/Charger is on its bottom.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Department of Communications.

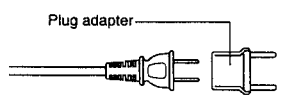
Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Class B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le ministre des Communications.

When using the AC Power Adapter/Charger in areas other than the USA

- The provided AC Power Adapter/Charger features automatic voltage selection in the AC range from 110 V to 240 V.

USING HOUSEHOLD AC PLUG ADAPTER

In case of connecting the unit's power cord to an AC wall outlet other than American National Standard C73 series type use an AC plug adapter, called a "Siemens Plug", as shown.
For this AC plug adapter, consult your nearest JVC dealer.



VHS C HQ

Cassettes marked VHS C can be used with this camcorder.

This camcorder is designed to be used with NTSC-type color television signals. It cannot be used for playback with a television of a different standard. However, live recording and viewfinder playback are possible anywhere. Use the BN-V12U/V22U/V25U/V60U battery packs and, to recharge them, the provided multi-voltage AC Power Adapter/Charger. (An appropriate conversion adapter may be necessary to accommodate different designs of AC outlets in different countries.)

INFORMATION

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Change or modifications not approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
Reorient or relocate the receiving antenna.
Increase the separation between the equipment and receiver.
Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
Consult the dealer or an experienced radio/TV technician for help.

ATTENTION:

The product that you have purchased is powered by a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

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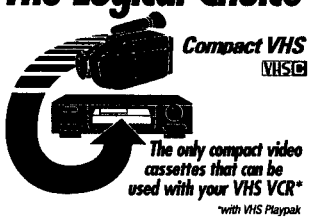
MAJOR FEATURES

REMEMBER

The Logical Choice



No other compact cassettes can be played back on your VHS VCR*.

JVC COMPACT VHS ADVANTAGES

☞ **Convenience**
Easy playback on your VHS deck* — no hook-ups necessary.

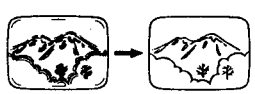
☞ **Conserve**
You don't have to use the camcorder for playback — this reduces the wear of the camcorder.

☞ **Comfort**
Can use the convenient features of your VCR with the remote control from your easy chair.

☞ **Communication**
Can send your tapes to others who also own a VHS VCR.

☞ **Choice**
Can also view the playback picture through the viewfinder or connect directly to a TV.

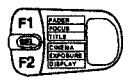
Digital Image Stabilizer (☞ P. 18)



Program AE with Special Effects (☞ P. 20, 21)

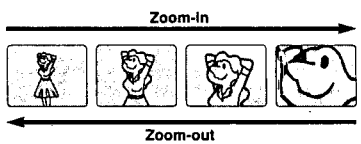
■ *Auto Mode Lock* ■ *Auto Mode Release*
■ 120x Digital Zoom ■ Strobe Effect
■ Classic Film ■ Twilight ■ Slow Shutter
■ Sports ■ High Speed (1/2000 sec.) Shutter

Intelligent Function Control (☞ P. 23 – 27)



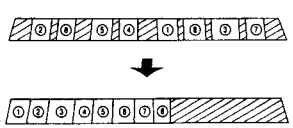
Snapshot and Motor Drive Modes (☞ P. 19)

120x Digital Hyper Zoom (☞ P. 18)



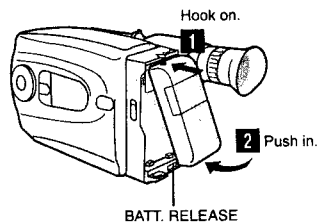
Integrated Auto Light (☞ P. 19)

Random Assemble Editing (☞ P. 35 – 37)



QUICK OPERATION GUIDE

SUPPLY POWER

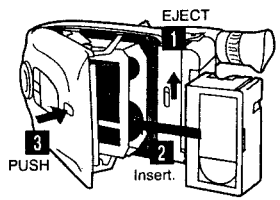


Using the battery pack

1 Hook-on the battery pack's top end to the camcorder. (Charging procedure, ☞ P. 10)
2 Push in the battery pack until it locks into place.

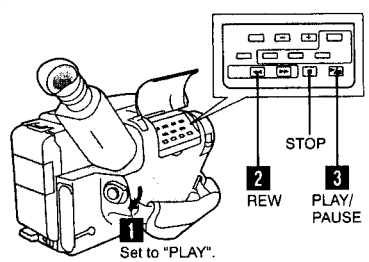
To remove the battery pack
Slide BATT. RELEASE and pull out the battery pack.

INSERTING A VIDEO CASSETTE



1 Slide EJECT.
2 Insert a video cassette.
3 Press PUSH.
(For more details, ☞ P. 13.)

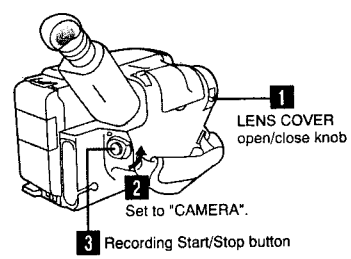
PLAYBACK



1 Set the power switch to "PLAY".
2 Press REW.
— The tape will automatically stop at the beginning of the tape.
3 Press PLAY/PAUSE.
— Playback starts and playback picture appears in the viewfinder.
■ To stop playback, press STOP.
(For more details, ☞ P. 30.)

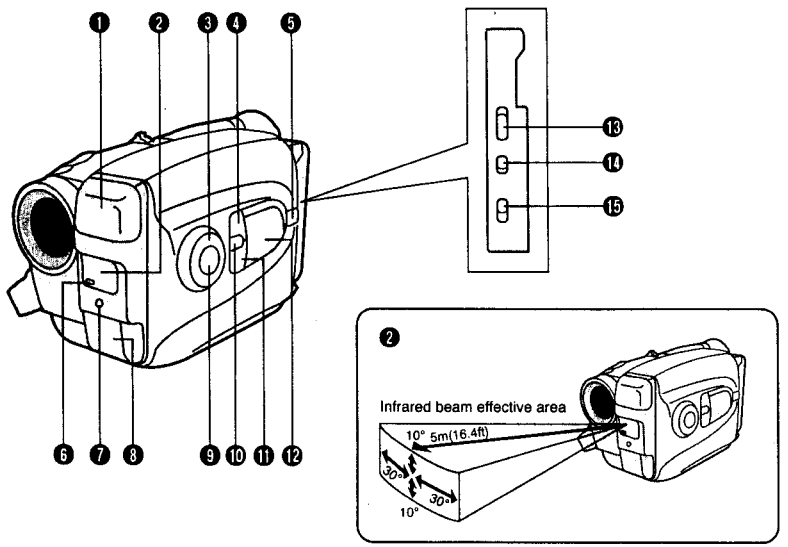
■ Or simply play back the tape on a VHS VCR using the Cassette Adapter (VHS Playpak). ☞ P. 32

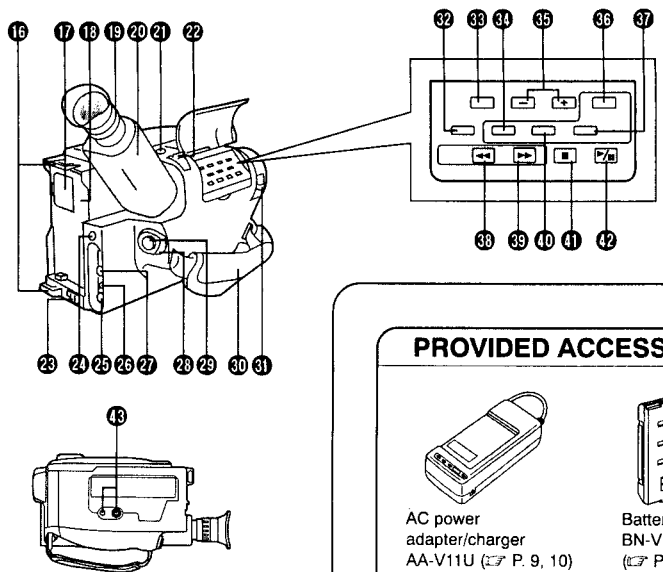
SHOOTING



1 Slide the LENS COVER open/close knob to open the lens cover.
2 Set the power switch to "CAMERA".
— The power indicator will light and image will be seen in the viewfinder.
3 Press the Recording Start/Stop button.
— Recording starts.
■ To stop recording temporarily, momentarily press the Recording Start/Stop button once again.
(For more details, ☞ P. 16)

CONTROLS AND CONNECTORS





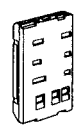
No.	Page
❶ Video light	*19, 40*
❷ Infrared beam sensor window Receives the transmitted beam signal from the remote control unit. * The transmitted beam may not be effective or may cause misoperations when the infrared beam sensor window is directly exposed to sunlight or powerful lighting. • Be careful not to cover this area; built-in here is the sensor necessary for shooting.	
❸ PROGRAM AE select dial	*20*
❹ F1 (Function 1) button For Fader, Focus and Titles.	*23, 24, 27*
❺ PUSH button	*13*
❻ Tally lamp	*16*
❼ REMOTE jack (capped) For connection of the RM-V20U wired remote control unit (optional).	
❽ Microphone	
❾ D.I.STABILIZER (Digital Image Stabilizer) button	*18*
❿ Function SEL. (select) button	*23*
⓫ F2 (Function 2) button For Cinema, Exposure and Display.	*23, 25, 26*
⓬ LCD window	*23*

No.	Page
⓭ EJECT switch	*13*
⓮ AUTO PAUSE ON/OFF switch	*17*
⓯ LIGHT ON/AUTO/OFF select switch	*19*
⓰ Eyelets for shoulder strap	*15*
⓱ Clock battery compartment	*12*
⓲ Battery pack mount	*9*
⓳ Diopter adjustment	*14*
⓴ Electronic viewfinder	*14, 45*
㉑ SNAPSHOT button	*19*
㉒ Power zoom switch	*18, 25*
㉓ BATT. (battery) RELEASE switch	*9*
Connectors	
The jacks ㉔ to ㉗ are located beneath the jack cover.	
㉔ EDIT jack	*34, 37*
㉕ VIDEO out jack	*33, 34, 37*
㉖ RF DC OUT jack For connection of the RF-V5U RF unit (optional).	*33*
㉗ AUDIO out jack	*33, 34, 37*
㉘ POWER switch	*16, 30*
㉙ Recording Start/Stop button	*16*
㉚ Grip strap	*15*
㉛ LENS COVER open/close knob	*16, 40*

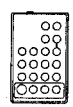
No.	Page
Operation buttons	
The buttons ㉜ to ㊷ are located beneath the cover.	
㉜ MWB (Manual White Balance) button	*22*
㉝ SP-EP recording mode and T20·30·40 tape length select/COUNTER R (reset)/M (memory) button	*14, 31*
㉞ EDIT button	*34, 37*
㉟ DATE/TIME/CHAR. –/+ select/TRACKING buttons	*12, 27, 30*
㊱ DATE/TIME/CHAR. SET/R.A.EDIT IN/OUT button	*12, 36*
㊲ R.A.EDIT button	*36*
㊳ REW/RETAKE R/⊏ (Quick Review) button	*17, 30*
㊴ FF/RETAKE F button	*17, 30*
㊵ R.A.EDIT CANCEL button	*36*
㊶ STOP button	*30*
㊷ PLAY/PAUSE button	*30, 31*
Bottom	
㊸ Tripod mounting socket	*15*

PROVIDED ACCESSORIES

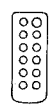
AC power adapter/charger AA-V11U (☞ P. 9, 10)



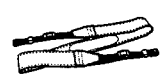
Battery pack BN-V12U (☞ P. 9, 10)



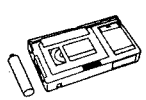
Remote control unit RM-V706U (provided with GR-AX900) (☞ P. 8, 28, 38)



Remote Control Unit RM-V705U (provided with GR-AX800) (☞ P. 8, 28, 38)



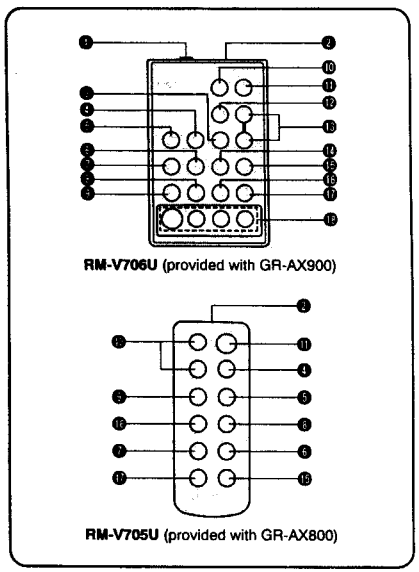
Shoulder strap (☞ P. 15)



Cassette adapter (VHS Playpak) C-P7U (☞ P. 32)

Editing cable (☞ P. 34, 37)

Lithium battery CR2025 (☞ P. 8, 12)



RM-V706U (provided with GR-AX900)

RM-V705U (provided with GR-AX800)

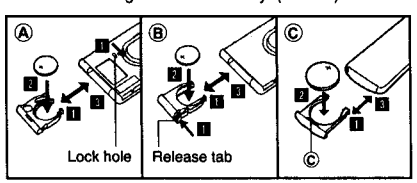
REMOTE CONTROL UNIT

The provided Full-Function Remote Control Unit can operate this camcorder from a distance as well as the basic operations (PLAY, STOP, PAUSE, FF, and REW) of your VCR. This remote control unit makes additional recording functions possible.

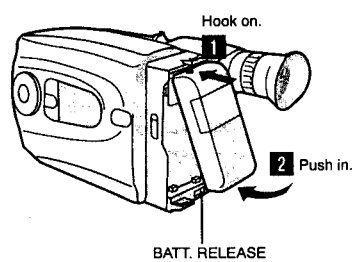
Inserting the battery

1. Pull out the battery holder according to the type of remote control unit you have.
   - Type Ⓐ : Pull out the battery holder while sliding the lock hole.
   - Type Ⓑ : Pinch the release tab and pull out the battery holder.
   - Type Ⓒ : Pull out the battery holder by inserting a pointed instrument into slot Ⓒ.
2. Insert the lithium battery (CR2025), with its plus (+) side up, into the battery holder.
3. Replace the battery holder until it clicks in place.

*Read warning on lithium battery. (☞ P. 2)



Buttons	Functions	
	With the camcorder's power switch set to "CAMERA".	With the camcorder's power switch set to "PLAY".
● PAUSE IN connector	—	☞ P. 37
● Infrared beam transmitting window	Transmits the beam signal.	
● MBR SET button	—	☞ P. 35
● INT. TIME button	Self-Timer/Time lapse (☞ P. 28, 29)	—
● REC TIME button	Animation/Time lapse (☞ P. 29)	—
● FF button	Retake (Forward)	FF/FF Shuttle Search
● REW button	Retake (Rewind)	Rew/Rew Shuttle Search
● PAUSE button	—	Pause
● PLAY button	—	Playback start
● SNAPSHOT button	Snapshot (☞ P. 19)	—
● START/STOP button	Functions same as the Recording Start/Stop button of the camcorder.	
● VISS button (RM-V706U only)	Index code marking (☞ P. 18)	—
● ZOOM (T/W) buttons	Zoom (invariable speed, ☞ P. 18)	—
● VCR CTL button (RM-V706U only)	—	☞ P. 35
● A. DUB button	—	Audio dubbing (☞ P. 39)
● STOP button	—	Stop
● INSERT button	—	Insert Editing (☞ P. 38)
● R. A. EDIT buttons (RM-V706U only)	—	☞ P. 36

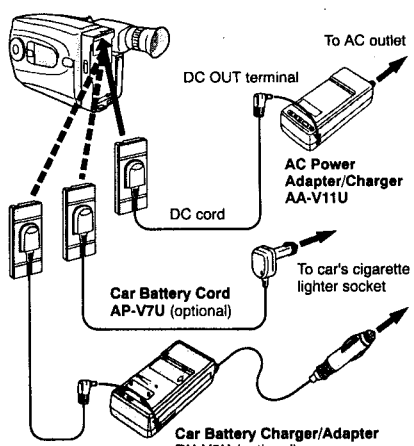


Approximate recording time

	GR-AX900	GR-AX800
BN-V12U	60 min. (35 min.)	60 min. (40 min.)
BN-V22U	120 min. (80 min.)	130 min. (80 min.)
BN-V25U	165 min. (105 min.)	170 min. (110 min.)
BN-V60U	120 min. (80 min.)	130 min. (80 min.)

( ): when the video light is on

- The recording time per charge is influenced by the duration of the recording standby, frequency of zooming, etc. It is safer to have spare battery packs.



POWER SUPPLY SYSTEM

The convenient 3-way power supply system gives you a choice of the most appropriate power supply unit, depending on the application.

- No function is available without power supply.
- Do not use any power supply other than specified.
- Never attempt to use these power supply units with any equipment other than the camcorder.
- The provided AC Power Adapter/Charger features automatic voltage selection in the AC range from 110 V to 240 V.

WITH BATTERY PACK

The battery pack has been kept in the uncharged state for shipment. Therefore, before use, be sure to charge it. (☞ See next page.)

Attaching the battery pack

1. Hook-on the battery pack's top end to the camcorder. (Charging procedure, ☞ P. 10)
2. Push in the battery pack in until it locks into place.

To remove the battery pack

Slide BATT. RELEASE and pull out the battery pack.

WITH AC POWER

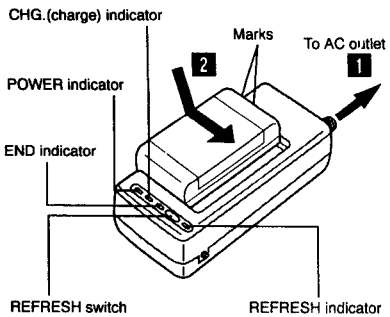
Use the AC Power Adapter/Charger.

IN A CAR

Use the Car Battery Cord or Car Battery Charger.

- Leave the car's engine idling when using the car battery.
- The battery pack can also be recharged with the BH-V3U.
- Refer to the instruction booklet of the BH-V3U (for use with 12 V or 24 V negative grounded cars only) and the AP-V7U (for use with 12 V negative grounded cars only).

(Continued on next page.)



	Charging time	Discharging time
BN-V12U	approx. 70 min.	approx. 210 min.
BN-V22U	approx. 130 min.	approx. 420 min.
BN-V25U	approx. 160 min.	approx. 600 min.
BN-V60U	approx. 130 min.	approx. 420 min.

- The diagrams above indicate the approximate charging and discharging times of battery packs that are fully charged.
- Charging time and discharging time will vary depending on the ambient temperature and the status of the battery pack.

POWER SUPPLY SYSTEM (Cont'd)

CHARGING/DISCHARGING THE BATTERY PACK

Charging the battery pack

1 Connect the AC power cord to a wall outlet.
— The power indicator lights.
2 Align marks and slide the battery pack in the direction of the arrow until it locks in place.
— The CHG. indicator lights.
— When charging has been completed, the END indicator will light.
3 Slide the battery pack in the opposite direction of the arrow.

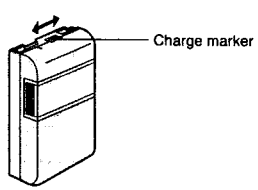
Using the REFRESH feature

The REFRESH feature on the AC power adapter allows you to completely discharge the power from the battery pack before charging. After charging the battery pack several times, the actual battery operating time will gradually decrease. For this reason it is recommended to use the REFRESH feature only after every 5 charges.

[1] Attach the battery pack to the adapter as illustrated above.
[2] Push REFRESH.
— The REFRESH indicator will light and discharging will begin.
— After discharging is completed, the indicator will go off.

CHARGE MARKER OF THE BROADCAST BATTERY PACK

Located on top of the battery, this marker is convenient for reminding you of the battery's charge status. Decide for yourself which marker colors — red and black — will represent charged and discharged.



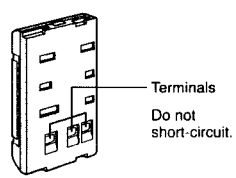
■ **"Battery charged" — RED**
After charging (as soon as charging is completed), set this marker so that red appears.
■ **"Battery discharged" — BLACK**
Upon detaching the discharged battery from the camcorder, set this marker so that black appears.

CAUTION
This marker does not move automatically. Make sure that the marker is properly set to accurately indicate the battery's charge status.

Notes:

- Do not repeatedly recharge a battery pack without fully discharging it. Its service life will decrease. Use the REFRESH feature after every 5 charges.
- Even if a battery pack is fully charged, but is not used, it naturally discharges gradually. Be sure to recharge the battery pack just before using it, or the day before you intend to use it.
- This unit is normally warm during operation. Operate it in places having good ventilation. Do not allow it to discharge in a container, such as a bag, etc. Blocking the ventilation causes the temperature inside the unit to rise, possibly resulting in a damaged unit.
- If either recharging or discharging is stopped in the middle of the process, remove the battery pack before unplugging the AC cord.
- This unit incorporates an over-discharging protection circuit; however, immediately remove the battery pack from this unit after discharging has been completed to maintain the battery pack's capacity.
- If used near a radio, the AC Power Adapter/Charger may interfere with reception.
- Be sure to unplug the DC cord before charging or discharging the battery pack.
- Before storing the battery pack for a long period it is recommended to discharge it.
- The REFRESH feature will not function if the power status of a battery pack is discharged (No power remaining).
- When the CHG.indicator is blinking, the battery pack has become hot. Wait for a while for the battery pack to cool.
- With a just-purchased battery pack, or with a battery pack that has been stored for a long period, the CHG. indicator may not light properly. In such a case, remove and reattach the battery pack again, then do the recharging procedure. The CHG. indicator should light during recharging to indicate, the battery pack is normal. If this is not the result, consult your nearest JVC dealer.

The battery packs are nickel-cadmium batteries. Be sure to carefully read the following caution. When using an optional battery pack, please also read attached caution.



Temperature ranges:
The recharging time is based on room temperature of 20°C.
The lower the temperature, the longer the recharging time.
For charging:10°C to 35°C
For operating:0°C to 40°C
For storing:–10°C to 30°C

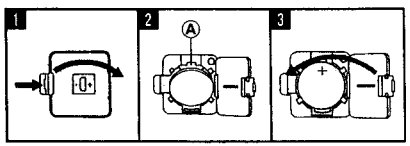
■ **To avoid hazard:**
- Do not burn.
- Do not short-circuit the terminals.
- Do not modify or disassemble.
- Use only specified chargers.

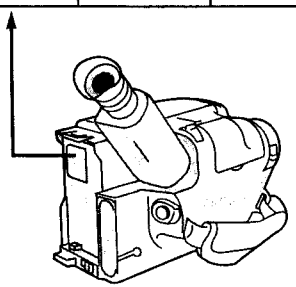
■ **To prevent damage and prolong service life:**
- Avoid dropping, unnecessary shocks.
- Avoid repeated charging without discharging.

■ **This unit has a limited service life:**
Near the end of its service life, when it begins to deliver less recording time per charge, purchase a replacement.

■ **It is normal for the unit to be warm after charging or use.**

■ **This is a chemical reaction type battery; its properties are best maintained under the following conditions:**
- Optimum charging takes place at temperatures between 10°C and 35°C. Cooler temperatures impede chemical reaction. Warmer temperatures can prevent complete charging.
- Store in a cool dry place. Extended exposure to high temperatures will increase natural discharge and shorten service life.
- Total natural discharge may occur during long storage periods. (Uncharged storage is preferable; recharge one day before use.)
- Remove from charger or powered unit when not in use; some machines use current even when switched off.





CLOCK (LITHIUM) BATTERY INSERTION

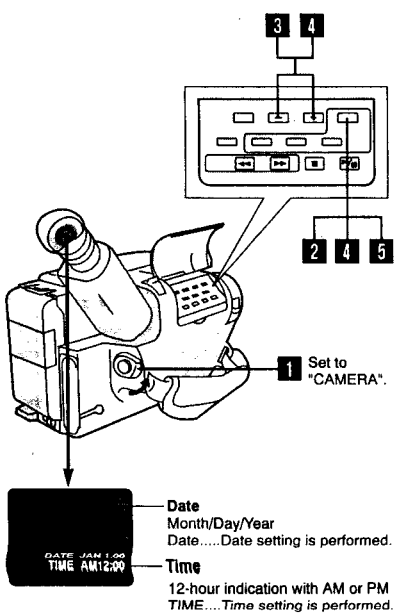
Necessary for clock and date/time settings.

* Switch off the unit's power and remove the power supply unit before inserting or removing the clock battery.

1 Open the clock battery compartment cover while pressing the release tab.
2 Insert the provided lithium battery with the plus (+) side up and push it in.
   * When removing the battery, insert a pointed non-metallic object between the battery and the compartment (Ⓐ) to pull it out.
3 Close the compartment cover until it clicks in place.

Warning on lithium battery
- Dispose of used battery promptly.
- Keep away from children.
- Do not disassemble and do not dispose of it in fire.

(See Warning on lithium battery, ☞ P. 2)

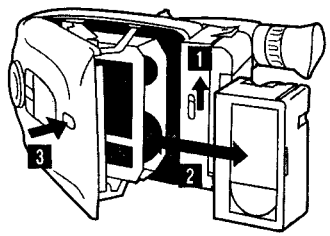


SETTING DATE/TIME

Before adjusting the date and time for the first time or after replacing the clock battery.

1 Set the power switch to "CAMERA".
2 Press SET. — The month blinks.
3 Press – or + to choose the correct month.
4 Repeat steps 2 and 3 to set the day, year, hour and minute.
5 Press SET to start the clock.
   — Now that the setting is completed, blinking stops. Both the date and time will be displayed for confirmation, after which the date remains displayed by itself.

Notes:
- While the date or time are blinking, the clock does not keep time.
- When re-adjusting the data, press SET and –/+ to correct them. After adjustment is completed, both the date and time appear for confirmation, then the display returns to the mode before correcting.
- When PROGRAM AE is set to "AUTO MODE LOCK" (☞ P. 20), the date and time are displayed immediately after adjustments, after which the display automatically changes to Auto Date record mode. (☞ P. 26)



LOADING AND UNLOADING A CASSETTE

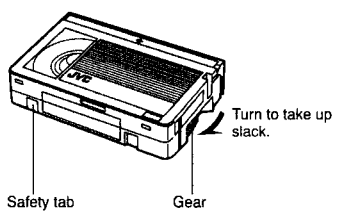
Loading

1 Slide EJECT. — The cassette holder opens.
2 Insert the cassette with its label facing outward.
3 Press PUSH and make sure that the cassette holder is closed and locked.

Unloading

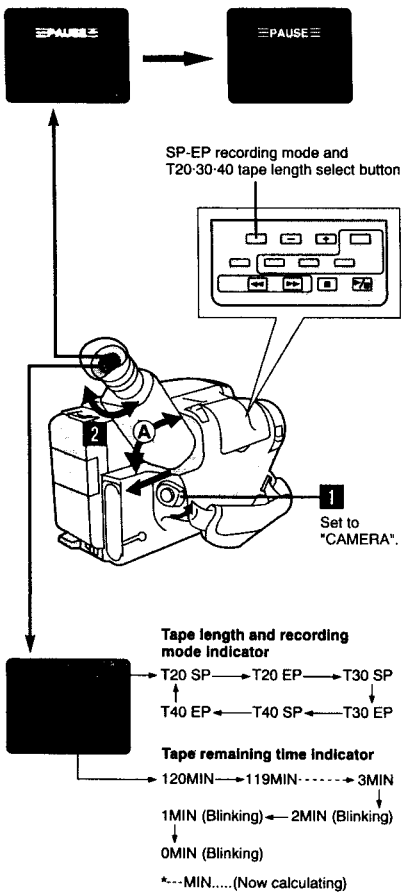
1 Slide EJECT. — The cassette holder opens.
2 Remove the cassette.
3 Press PUSH and make sure that the cassette holder is closed and locked.

Note:
Sliding EJECT may open the cassette holder a few seconds later. Do not open the cassette holder by force.



Storage of cassettes
- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid storing the cassettes in humid or dusty places.
- Do not drop the cassettes. Do not expose them to violent vibrations or shocks.
- Do not expose the cassettes to strong magnetic fields (near a motor, transformer or magnet).
- Place the cassettes in cassette cases and position them vertically.

- This camcorder employs only the cassettes carrying the VHS-C mark.
- Recording onto prerecorded tapes automatically erases the previously recorded video and audio signals.
- An inverted cassette cannot be inserted.
- Do not load and unload the cassette repeatedly without allowing the tape to run at all. This will slacken the tape and thereby damage it.
- Make certain before loading the cassette that the tape is not slack. If there is any slack, turn the gear on the cassette in the direction of the arrow to take up slack.
- The cassette is equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording is impossible. If you wish to record on a cassette whose tab has been removed, use adhesive tape to reseal the slot.
- To avoid excessive exposure to dust and fingerprints, do not open the front tape cover.


PAUSE
SP-EP recording mode and
T20·30·40 tape length select button
Set to
"CAMERA".
Tape length and recording mode indicator
T20 SP → T20 EP → T30 SP
T40 EP ← T40 SP ← T30 EP
Tape remaining time indicator
120MIN → 119MIN ····· → 3MIN
1MIN (Blinking) ← 2MIN (Blinking)
0MIN (Blinking)
*---MIN.....(Now calculating)

VIEWFINDER ADJUSTMENT

- **Positioning**
  The viewfinder can be positioned for best viewability (Ⓐ).
- **Diopter adjustment**
  The viewfinder lens can be adjsuted to suit the operator's eyesight.

1 Set the power switch to "CAMERA".
2 Turn the diopter adjustment control until the indications in the viewfinder are clearly focused.

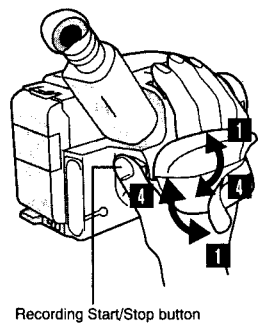
SET THE TAPE LENGTH AND THE RECORDING MODE

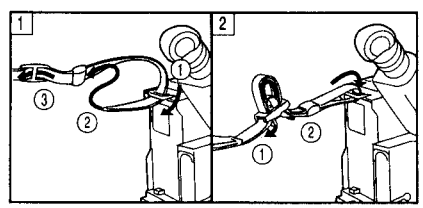
The tape remaining time is displayed in the viewfinder as shown. Before shooting, press the recording mode and tape length select button according to the tape length and the recording mode to be used.

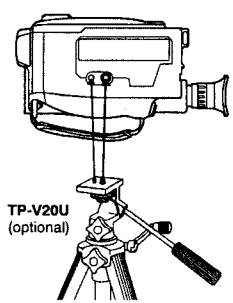
- **T20** : When using a tape with 20-minute recording time (SP).
- **T30** : When using a tape with 30-minute recording time (SP).
- **T40** : When using a tape with 40-minute recording time (SP).
- **SP** : To maintain sound and picture quality. Better for dubbing later.
- **EP** : To record 3 times longer than when in the SP mode. For more economical use of tape.

Notes:

- If the recording mode is switched during actual recording on the same tape, the playback picture will be blurred at the point of switching.
- The indicated remaining time is approximate.
- The time required to calculate the remaining tape length and accuracy of the calculation may vary according to the type of tape used.
- "TAPE END" appears when the tape reaches its end. "TAPE END" also appears when a cassette is loaded whose tape is already at its end.
- The tape remaining time displayed in the viewfinder is correct only if the correct tape length is selected.







ADJUSTING THE GRIP

1 Separate the Velcro strip to expand the loop.
2 Pass your right hand through the loop and grasp the grip.
3 Adjust the length of the strap so that your thumb and fingers can easily operate the Recording Start/Stop button and power zoom buttons.
4 Refasten the Velcro strip.

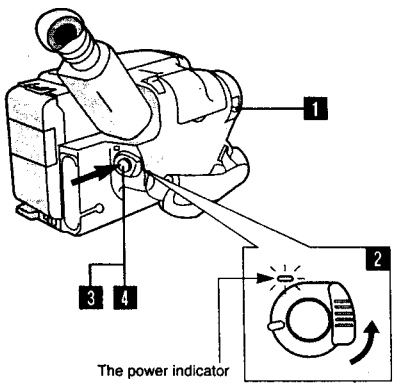
ATTACHING THE SHOULDER STRAP

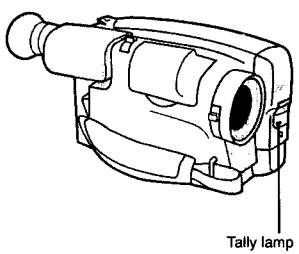
1 Loop the end of the strap over the top of the eyelet ①, then, folding it back, thread the end of the strap first through the keeper ②, then the buckle ③. Making sure that the strap is not twisted, repeat the above procedure to attach the other end of the strap to the other eyelet.
2 Adjust the shoulder strap to the desired length ①, then slide both keepers up snug against the eyelets to prevent the strap from slipping ②.

ATTACHING TO A TRIPOD

Align the screw and camera direction stud of the tripod with the camera's tripod mounting socket and stud hole, and firmly tighten the screw.

RECORDING OPERATION





SHOOTING

Preparations

- Supply power. (☞ P. 9.)
- Insert a video cassette correctly. (☞ P. 13.)
- Adjust the grip strap. (☞ P. 15.)
- Set SP/EP as required. (☞ P. 14.)

1. To enter the Record-Standby mode

1 Slide the LENS COVER open/close switch to open the lens cover.

2 Set the power switch to "CAMERA".

— The power indicator lights and the camcorder enters the Record-Standby mode.
The aimed-at scene will appear on the viewfinder screen.

Record-Standby mode indication

2. To shoot the scene

3 Press the Recording Start/Stop button to start recording.

— The tally lamp lights while the recording is in progress.

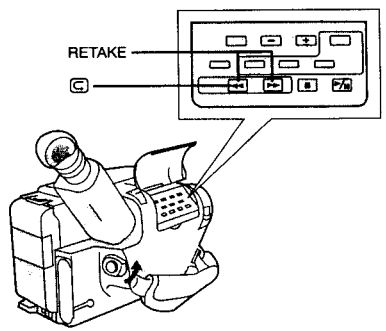
Recording mode indication

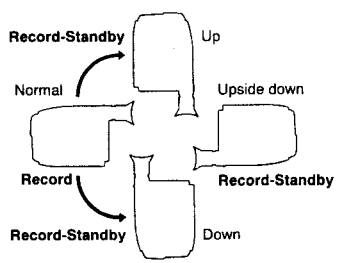
4 To stop recording temporarily. (To enter the Record-Standby mode)
Press the Recording Start/Stop button once again.

- To restart recording.
  Press the Recording Start/Stop button.
- Repeating steps 3 and 4 produces assemble recordings.

Notes and Advice

- For a longer pause, set the power switch to "POWER OFF" to save power.
- When a tape reaches its end during recording, "TAPE END" indicator will appear in the viewfinder and power itself off automatically if left for longer than 5 minutes.
- If the Record-Standby mode continues for longer than about 5 minutes, the unit switches itself off automatically. To restart recording, turn the power on and press the Recording Start/Stop button. This makes clean assembled recordings possible even after a long pause.
- When turning off the camcorder with the power switch set to "CAMERA", be sure to set the switch to "POWER OFF" first. Then *set it back to "CAMERA" to turn on the camcorder again.*
- When recording with a cassette that has been removed from the unit in the middle of use, first re-locate the end of the last recording (i.e. the point that you want to start recording from) by using the Retake function (☞ P. 17) after re-inserting the *cassette. Otherwise, the end of the last recording may be erased.*
- Lens cover warning blinks for approx. 5 seconds, whether the lens cover is open or closed, everytime the unit is turned on. It lets the user check to see if the cover is open. (☞ P. 45)





QUICK REVIEW

If you want to review the end of the last recording for confirmation, use this function.

- Press ⏪ for less than 2 seconds from the Record-Standby mode.
  — The tape will be rewound for about 2 seconds of program time and played back automatically for this section, after which it will pause in the Record-Standby mode for the next shot.

RETAKE

While recording, you may decide to re-record certain segments. The Retake function is convenient for this.

1 Make sure the camcorder is in the Record-Standby mode. (If not, engage the mode.)

2 Press either RETAKE to reach the point where you wish a new recording to start.

- When RETAKE is released, the camera will enter the Record-Standby mode again.

3 Press the Recording Start/Stop button.

— Recording starts.

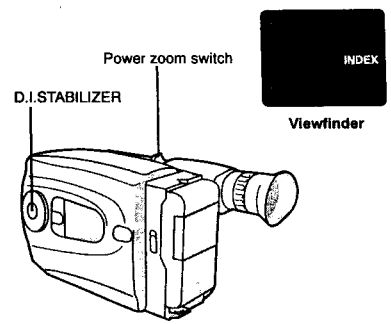
AUTO PAUSE

With the Auto Pause system, the camcorder automatically stops recording when it is pointed down. This function prevents shooting the ground, your feet, etc. by mistake.

- Set AUTO PAUSE to "ON".
  — When the camcorder is tilted down by a large degree from its horizontal position during recording, it will automatically enter the Record-Standby mode, and the "AUTO PAUSE" indication will appear in the viewfinder.
  — Pressing the Recording Start/Stop button resumes recording.
- The Auto Pause system is also effective when the camcorder is pointed up or upside down.
- This system is also effective about a large degree twist to the left or right side from the horizontal position.
- To shoot in any of the above mentioned positions,set AUTO PAUSE to "OFF".

Notes and Advice

- Distortion might occur when playback starts in the Quick Review mode. This is normal.
- Noise may appear during Retake. This is normal.

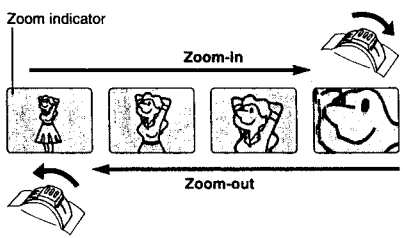


INDEX CODE MARKING

The VHS Index Search System (VISS) gives you automatic access to any point you select on a recording. Only the marking aspect of the Index Search System is included in this unit. It allows index codes to be placed on recorded tape for convenient dubbing or editing on VCRs with an Index Search function.

- An index code is always marked at the beginning of the first recording after the date advances and a cassette is inserted.
  — "INDEX" blinks while marking.
- The RM-V706U/RM-V700U* remote control unit allows index codes to be marked in any desired position. (☞ P. 28)

*The RM-V706U is provided with GR-AX900, and the RM-V700U is optional.



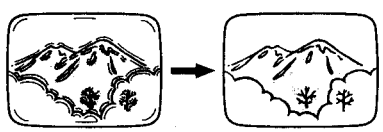
ZOOMING

Pushing up/pulling down the power zoom switch ("T" and "W") will vary the focal length of the lens and hence produce zooming effect.
Maximum magnification is approximately 24x. Zooming level from 12x to 24x (between "T" and "D" of the zoom indiator) is digital magnification.

Procedure

- Pulling down to T : Zoom in on the image (bring it nearer).
- Pushing up to W : Zoom out.
- Zooming speed is variable. The further the switch is pulled down or pushed up, the faster the zoom speed becomes.

When the PROGRAM AE select dial is set to "120x Digital Zoom", up to 120x magnification is possible. (☞ P. 20)



DIGITAL IMAGE STABILIZER

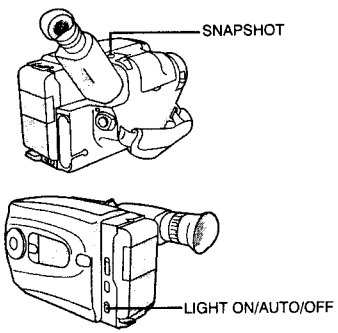
To compensate for the unstable images caused by camera-shake (especially noticeable at high zoom ranges), this camcorder incorporates a Digital Image Stabilizer .

To switch on/off the Digital Image Stabilizer:
Press D.I.STABILIZER.

- While the Digital Image Stabilizer is engaged, "D.I." appears in the viewfinder.

Notes and Advice

- Focusing may become unstable during the zooming-in operation. In this case, first zoom in in the Recording Standby mode then, after using the manual focusing or the Focus Lock function (☞ P. 24, 25) to hold the focus fixed, zoom in or out in the Record mode.
- When shooting low-contrast subjects in the Zoom-in mode, the camcorder automatically zooms out with the low contrast indicator (☞ P. 24) blinking and focus being performed.
- Digital zoom magnification processes the image electronically, causing a reduction in picture quality.
- Accurate stabilization may not be possible if hand shake is excessive, or when shooting the following: • Subjects with vertical or horizontal stripes • Low contrast subjects • Dark/dim subjects • Subjects with excessive backlighting • Scenes with movement in various directions • Low contrast backgrounds
- Digital Image Stabilizer (DIS) cannot be used while Strobe, Classic Film or Slow Shutter are activated. When any of these turned on while DIS is already on, the "D." indicator blinks, telling you that DIS is unable to function.
- When shooting with the camcorder on a tripod, be sure to switch off the Digital Image Stabilizer.
- Auto marking also takes place when the date changes while shooting. In this case, the first recording after that does not mark an index code at its beginning.



CAUTIONS:

- The video light becomes extremely hot. Do not touch it either while in operation or soon after turning it off, otherwise serious injury may result.
- Do not place the camcorder into the carrying case immediately after using the video light, since it remains extremely hot.
- When operating, keep a distance of about 30 cm (1 ft.) between the video light and people or object.
- Do not use near flammable or explosive materials.

SNAPSHOT MODE

This interesting feature lets you record a white-bordered digital still that looks just like a photograph is being taken. Use it to liven up recordings of parties, weddings, graduations, and so on.

To engage the Snapshot mode:
Press SNAPSHOT.

- When engaged during recording, there will be a momentary camera shutter-type blackout, and a white-bordered still image is displayed and recorded for approx. 3 seconds. This still image automatically fades out, and the unit resumes normal recording.
- If engaged during pause, a still image is recorded for 3 seconds. After that, the unit enters the Record Pause mode.

Motor Drive mode:
Keeping SNAPSHOT pressed provides the effect similar to serial photography. (The interval between the still pictures: approx. 0.6 seconds)

To apply more light to the

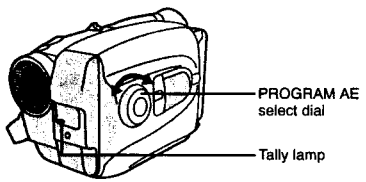
When natural lighting is too dim, you can brighten the scene by using the built-in video light.

1 Set the LIGHT ON/AUTO/OFF as required.
  ON : Always keeps the light on as long as the camcorder is turned on.
  AUTO : Automatically turns on the light when the camcorder senses insufficient lighting on the subject.
  OFF : Turns off the light.

- The video light can be used with the camcorder's power on.
- It is recommended to set the white balance to indoor mode (☀) (☞ P. 22) when you use the video light.
- When not using the video light, turn it off to save battery power.

Notes and Advice

- Even if the battery indicator (▭) does not blink in the viewfinder, if the battery pack's charge is low, the camcorder may turn off automatically when you turn on the video light, or when you start recording with the video light turned on.
- When the LIGHT ON/AUTO/OFF is set to "AUTO":
  - Depending on the lighting condition, the video light may not be stably turned on or off. In this case, switch the light on or off manually.
  - While the Sports or High-Speed Shutter mode (☞ P. 21) is engaged, the light is likely to stay on.
  - While the Twilight mode (☞ P. 21) is engaged, the light will not activate
  - The SNAPSHOT button of the RM-V706U (provided with GR-AX900) cannot be used for the Motor Drive mode.



Symbol on the PROGRAM AE select dial	Viewfinder indication*	Mode
LOCK	AUTO LOCK	Auto Mode Lock
RELEASE	AUTO RELEASE	Auto Mode Release
120x	D. ZOOM 120x	120x Digital Zoom
	STROBE	Strobe
	CLASSIC FILM	Classic Film
	TWILIGHT	Twilight
	SLOW SHUTTER	Slow shutter
	SPORTS	Sports
1/2000	S 1/2000	High Speed (1/2000 sec.) Shutter

* When the PROGRAM AE select dial is switched from one mode to another, the newly selected mode's name and its indication is displayed in the viewfinder for approx. 3 seconds. Then the name disappears, and only the indication remains.

PROGRAM AE WITH SPECIAL EFFECTS

A variety of creative shooting effects are accessible with the PROGRAM AE select dial.

To engage any of the effects:
Turn the PROGRAM AE select dial so that the desired indication appears in the viewfinder.
— The chosen mode is activated approx. 1 second later.

Auto Mode Lock mode

Setting to this mode locks the camcorder in the Full Auto mode, eliminating the possibility of misoperation by accidentally touching the following buttons while shooting. It is convenient when asking someone else to do the shooting.

These controls cannot be used in this mode:
CINEMA, FADER, FOCUS, EXPOSURE, DISPLAY, TITLES, MWB.

Auto Mode Release mode

Lets you use the controls that were inactive in the Auto Mode Lock mode.

120x Digital Zoom mode

Boosts the maximum zoom magnification to approx. 120x.

Strobe mode

Successive still images are displayed in timed intervals. (Sound remains unchanged.) Similar to that used in some music videos.

Classic Film mode

Faster-speed strobe with black-and-white image that offers the vintage look of a film being shown on a movie projector. Using it with Cinema Mode (☞ P. 23) creates an authentic movie theater look.

Twilight mode

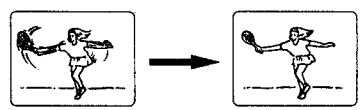
Disengages the auto gain control and auto focus, and automatically locks the focus to infinity and white balance to ☀ (outdoor) mode. Dusk and twilight scenery, fireworks, etc. look more natural and dramatic.
- Manual adjustment of white balance (☞ P. 22), and focus (☞ P. 24) is possible.
- Re-engaging the auto focus mode is possible. (☞ P. 24)

Slow Shutter mode

This mode slows down the shutter speed to 1/15-sec. to boost light sensitivity. If makes shooting possible in extremely low-light situations.
Slow-Shutter also creates trailing images like "commet tails" which can be used as a creative special effect.

Sports mode

Uses high shutter speed to clearly capture fast-moving action with less blur. Clarity is especially noticeable during slow motion playback on a video deck. Great for sports, races, etc.



Sports mode, High-Speed Shutter mode

High-Speed Shutter mode (1/2000s. shutter)

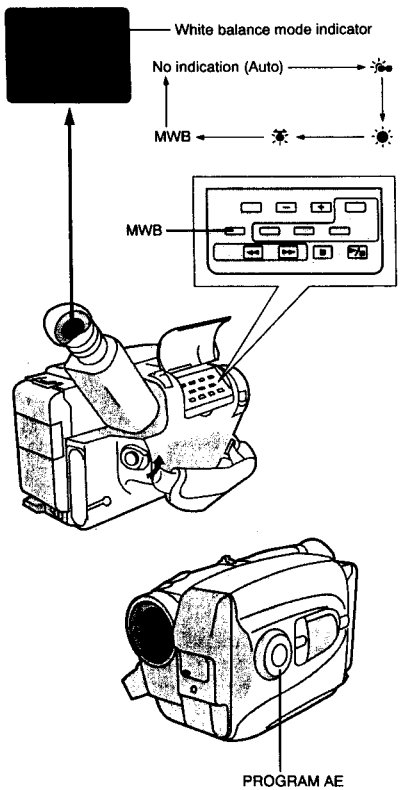
This mode sets the shutter speed to 1/2000 sec. to clearly capture fast-moving action with less blur. Clarity is especially noticeable during slow motion playback on a video deck. Great for sports (i.e., golf swing), races, etc.
This mode can capture faster action than the Sports mode can.

Notes and Advice

- Only one Special effect can be activated at a time.

Notes and Advice

- The screen becomes slightly dark with the High-Speed Shutter mode. Use this mode in the daytime outdoors and in other well-lighted situations.
- Picture color may be adversely affected in the High-Speed Shutter or Sports mode when the subject is lit by alternating discharge-type light sources such as fluorescent or mercury-vapor lights.



WHITE BALANCE ADJUSTMENT

This camcorder's Automatic Color Temperature system senses the color temperature of the ambient lighting for automatic white balance adjustment. However, precise color temperature adjustment is not possible under the following conditions:

- The object is in various shades of the same color.
- Predominantly red or brown object is being shot outdoors.

In these cases, use the camcorder's built-in preset filters for white balance adjustment.

To adjust the white balance:

Press MWB (Manual White Balance) so that the required indication appears in the viewfinder.

- ☀ .....When you shoot in the daytime outdoors (cloudy day)
- ☀ .....When you shoot in the daytime outdoors (sunny day)
- ☀ .....When the source of illumination is a halogen or tungsten lamp.
- MWB.....In the following situations.

How to use the MWB mode

In the MWB mode, the camcorder automatically adjusts the color temperature of the subject's light source and keeps that color temperature during shooting. When shooting some subjects with different color temperatures, use the MWB mode to set a color temperature and you can shoot with natural colors that are not affected by surroundings.

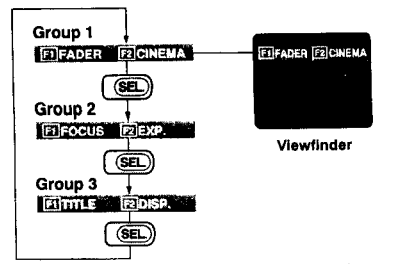
1. Press MWB until "MWB" appears in the viewfinder.
2. Point the camcorder at a white, flat object such as a sheet of white paper.
   Adjust focus manually. (☞ P. 24)
3. Keep MWB pressed for more than about 3 seconds.
   ❶ "MWB" blinks in the viewfinder.....During adjustment
   ❷ "MWB" is lit.....Adjustment is finished
   —The camcorder is now ready for shooting.

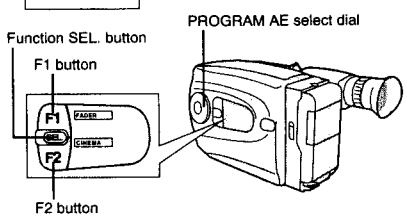
To switch to automatic adjustment:

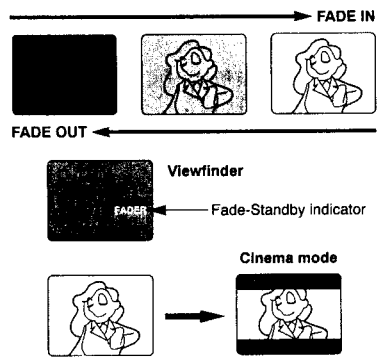
Press MWB until the indication disappears, or turn the PROGRAM AE to "LOCK".

Notes and Advice

- Re-adjust the MWB mode in the following conditions:
  - When the lighting has changed.
  - When the camcorder has been turned off and on again.
  - When PROGRAM AE's position has been changed.
- Manual White Balance adjustment is not possible when PROGRAM AE is set to "LOCK". (☞ P. 20)
- It is helpful to connect your camcorder to a color monitor when adjusting the white balance.







INTELLIGENT FUNCTION CONTROL

When using the following functions:
Fader, Cinema mode, Manual focus adjustment, Exposure control, Display mode, Instant Title

1. Set the PROGRAM AE select dial to any position except LOCK.
2. Press Function SEL. so that the required function's indication appears in the viewfinder.
3. Press either F1 or F2 button.
   - The function displayed on the right of F1: F1 button
   - The function displayed on the right of F2: F2 button

(For more details, ☞ P. 23 – 27)

FADER

This camcorder incorporates a fader function which allows smooth video fade-in and fade-out to a black blank screen.

Fade-in functions when the recording starts, and fade-out functions when the recording stops (and the Record-Standby mode is engaged.)

1. Press Function SEL. until "FADER" appears beside "F1".
2. Press F1 button.
   — The Fade-Standby mode is engaged.
   — "FADER" appears in the viewfinder.
3. Press the Recording Start/Stop button.
   — Fade-in/out functions.

CINEMA MODE

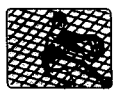
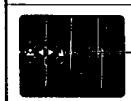
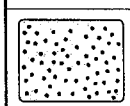
This camcorder incorporates a "Cinema" mode recording function which allows you to record black bars at the top and bottom of the screen to produce a cinema-like "wide-screen" effect.

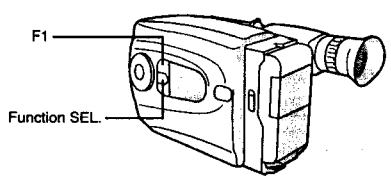
1. Press Function SEL. until "CINEMA" appears beside "F2".
2. Press F2 button.
   — The Cinema mode is engaged.

- To restore the normal screen:
  Press F2 button again while "CINEMA" is displayed beside F2 in the viewfinder.

Notes and Advice

- Setting the PROGRAM AE select dial to "LOCK" causes the F1 F2 indicators in the viewfinder to vanish (the Intelligent Function Control becomes unavailable.) When the dial is switched to any other position, the Group 1 indicators (F1 FADER F2 CINEMA) are restored.
- Keeping the Recording Start/Stop button pressed as long as required in the Fader mode allows the user to record a black blank screen.

	Two subjects at different distances overlap in the same scene.
	Low illumination.
	The subject has no contrast (differences in brightness and darkness), such as a flat, one-color wall, or a clear, blue sky, for instance.
	Low-contrast warning. A dark object is barely visible in the viewfinder.
	Minute patterns or identical patterns that are regularly repeated.



FOCUSING

Auto-focus

The camcorder's Full Range AF system can offer continuous shooting ability from close-up to infinity. The rectangular focus area detects focus. (No actual indication provided in the viewfinder.)

- Correct focus may not be obtained in these situations on the left. In such case manual focusing should be performed to obtain proper focus.

Focus lock

This camcorder's focus lock function is especially useful in the following situations:

- When things pass between your subject and the camcorder, make sure to engage the focus lock function, to lock your subject in focus before recording.
- If you want your main subject to appear in a corner of the screen, you should first center it at the desired distance, then use the auto focus mode for focusing, engage the focus lock function, and move the camcorder till the subject is where you want it.

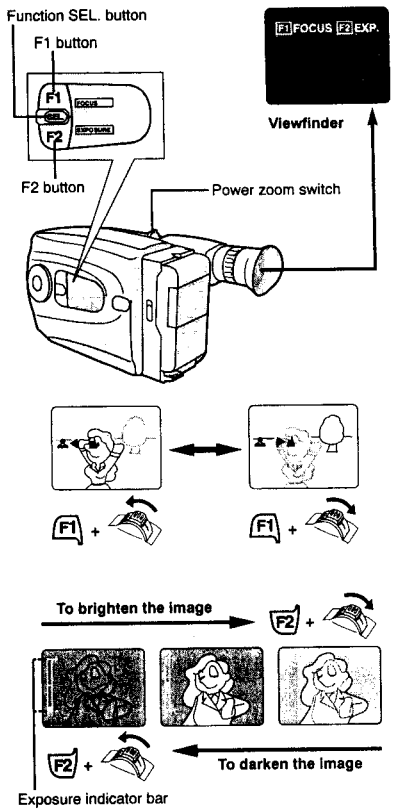
To lock the focus:

1. Press Function SEL. until "FOCUS" appears beside "F1".
2. Press F1.
   — The focus lock indication (◄►) appears in the viewfinder.

To release the focus lock mode
(To engage the Auto Focus mode):
Press F1. At the moment when the button is released, the focus lock mode is canceled.
— FOCUS LOCK indication (◄►) disappears.

Notes and Advice

- If the lens is smeared with stains or blurred with condensation, accurate focusing is not possible. Keep them clean. If they become dirty, wipe with a piece of soft cloth. When condensation occurs, dry them by wiping with a soft cloth or wait for conditions in which they become dry.
- The Focus Lock function is not available when PROGRAM AE is set to "LOCK". (☞ P. 20)
- When shooting a subject that is close to the lens, zoom out first (☞ P. 18). If zoomed-in in the auto-focus mode, the camcorder could automatically zoom out depending on the distance between the camcorder and the subject.



Manual focus

For manual focus operation, proceed as follows:

1. Press Function SEL. until "FOCUS" appears beside "F1".
2. Slide the power zoom switch (to "T" or "W") with F1 button pressed.
   - **To adjust the focus to a farther subject:** Slide to T. The Manual Focus indications (▲ ▶▲) appear, and ▶ blinks.
   - **To adjust the focus to a closer subject:** Slide to W. The Manual Focus indications (▲◄ ▲) appear, and ◄ blinks.
   - Two manual focusing speeds are available. For slow-speed, push/pull the switch slightly and hold that position. For fast-speed, push/pull the switch fully.
   - When the focus level cannot be adjusted any farther or closer, the indicator (▲) or the indicator (▲) will blink.
3. When finished with focus adjustment, release the power zoom switch.
   — The Focus indication (◄ or ►)disappears, and the focus lock indication (◄►) appears. The adjusted focus is locked in.

- **To release the Manual Focus mode** (to engage the Auto Focus mode):
  Press F1. At the moment when the button is released, the Manual Focus mode is canceled.
  — FOCUS LOCK indication (◄►) disappears.

Exposure control

This camcorder offers automatic adjustment of iris to provide the best available picture quality, but this can be overidden in cases when manual control of iris is desired.

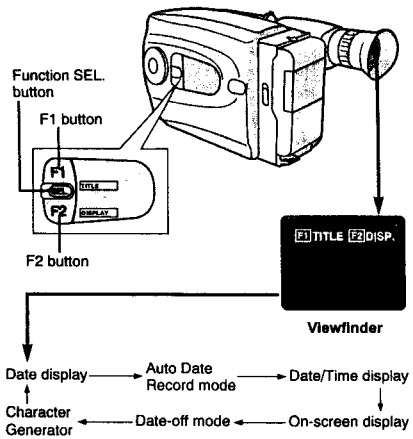
1. Press Function SEL. until "EXP." appears beside "F2".
2. Slide the power zoom switch ("T" or "W") with F2 button pressed.
   — The Exposure indicator bar appears in the viewfinder.
   - To brighten the image: Slide to T.
   - To darken the image: Slide to W.

- To restore the initial standard setting:
  Press F2. At the moment when the button is released, the standard setting is restored.
  — The Exposure indicator bar disappears.

Notes and Advice

- When you use the Manual Focus mode, be sure to focus the lens in the maximum telephoto position. If you focus in on a certain subject in the wide-angle position, sharply-focused images cannot be obtained when zoomed up because the depth- of-field is reduced at longer focal lengths.
- When focusing manually, make neccessary viewfinder adjustments (☞ P. 14), then focus in.
- Manual Focus operation and Exposure control are not available when PROGRAM AE is set to "LOCK". (☞ P. 20)
- With the Group 2 functions (F1: FOCUS, F2: EXP.(osure), ☞ P. 23) selected, the power zoom switch is ineffective while F1 or F2 button is kept pressed.

ADVANCED VIDEOGRAPHY TECHNIQUES (Cont'd)



Date display	Auto Date Record mode	
DEC 25.86	AUTO DATE	DEC 25.86
	Auto date record mode	Auto date record executed
Date/Time display	**Character Generator**	
DEC 25.86 PM 10:50	SET CHAR	IN PARIS, FRANCE
	No Characters stored	Example of stored characters

DATE/TIME CHARACTER INSERT

Select the display mode

The date/time/character can be displayed and recorded according to the selected mode.

1. Press Function SEL. until "DISP." appears beside "F2".
2. Press F2 while in the Record-Standby mode to cycle through the modes in the order shown on the left.

Recording the display

The selected display mode can be recorded.

- When no display is needed on the recorded tape, select Date-off mode before shooting.
- To delete the display during recording, press F2.
  - If the display is to be called back on the screen, put the camcorder into the Record-Standby mode first. Then press F2 to select the desired mode.

Auto Date Record function

These functions allow the date (month, day and year) to be automatically recorded for about 5 seconds following the first operation of the Recording Start/Stop button:

= after changing the date.
= after a cassette is loaded, or
= after its mode is selected by F2.

- In the Auto Date Record mode, the viewfinder indication shows the date during the initial 5 seconds, then changes to "AUTO DATE".

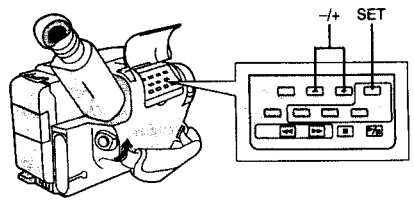
On-Screen Display Mode

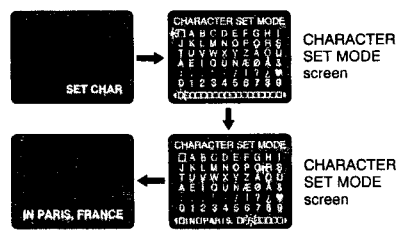
The viewfinder indications can also be displayed on the screen of a monitor connected to the camcorder.

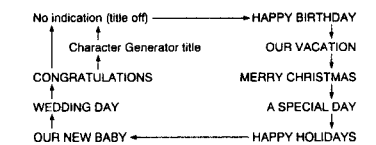
- Connect the camcorder to a video monitor. Press F2 until the viewfinder indications appear on the monitor screen.
- In the On-Screen Display mode, the date will be displayed and recorded.
- The on-screen display is not available during recording.

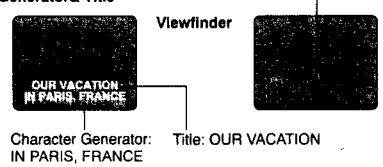
Notes and Advice

- The date/time/character display is available only after the date/time setting has been completed. (☞ P. 12)
- Setting PROGRAM AE to "LOCK" always engages the Auto Date record mode. (☞ P. 20) In this case, no other display modes are available.
- In Auto Date Record mode, the date indication is also recorded for approx. 5 seconds when the date changes while shooting. In this case, the first recording after that does not record the date indication at its beginning.









Character Generator

You can make your own title, store it in advance and superimpose it over the scene being shot.

How to store:

1. Press Function SEL. until "DISP." appears beside "F2".
2. Press F2 until "SET CHAR" or a title you have stored earlier appears in the viewfinder.
3. Press SET.
   — CHARACTER SET MODE screen will appear in the viewfinder.
4. Press –/+ to move the cursor, and then press SET to choose the desired characters.
5. Repeat step 4 to set all needed characters.
   — After all the desired characters have been entered, press SET as many times to exit the character set mode. The CHARACTER SET MODE screen will disappear, and the stored characters will be displayed.

INSTANT TITLES

The camcorder has eight pre-set Titles in memory. One of them can be superimposed above the Character Generator's stored title.

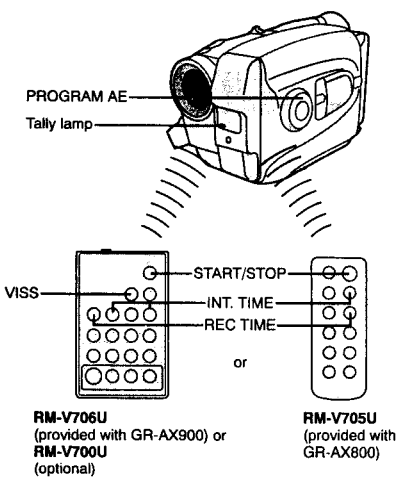
1. Press Function SEL. until "TITLE" appears beside "F1".
2. Press F1 while in the Record-Standby mode as many times as required until the desired Title is displayed. The Title changes in the sequence shown on the left.

- To delete the Instant Title during recording, press F1.
  - If the title is to be called back on the screen, put the camcorder into the Record-Standby mode first. Then press F1 to select the desired title.
- A personal title stored in the Character Generator can be displayed in the same position as the Instant Title.
  - The Instant Title's function can be used along with the Character Generator mode; consequently, a pair of identical stored titles can be superimposed.

Notes and Advice

- Up to 18 characters can be stored.
- Only one personally input title created with the Character Generator can be stored at a time. To replace it with another title, proceed as above again.
- To create a space between two characters in your own title, choose "□" on the CHARACTER SET MODE screen in the process of title storing.
- The Instant Title cannot be displayed when PROGRAM AE is set to "LOCK". (☞ P. 20)

ADVANCED VIDEOGRAPHY TECHNIQUES (Cont'd)



RM-V706U
(provided with GR-AX900) or
RM-V700U
(optional)

RM-V705U
(provided with GR-AX800)

MANUAL INDEX CODE MARKING

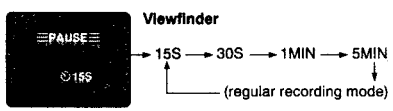
1. Press VISS once to put an index code onto the tape.
   — "INDEX" blinks during the marking process.

- If VISS has been pressed in the Record-Standby mode, an index code is put at the point where START/STOP is pressed.
- The VISS button is equipped on the RM-V706U and the RM-V700U.

SELF-TIMER

This Self-Timer function allows you to set the amount of time delay before recording starts after Start/Stop has been pressed. If the camcorder has been secured, the operator can enter the picture before actual recording begins.

1. Put the camcorder into the Record-Standby mode.
2. Press INT. TIME to select the interval time.
   — The following sequence of time setting is displayed with each press of INT. TIME:



3. Press START/STOP.
   - When the selected time has elapsed, recording begins automatically.
   - The tally lamp blinks, and its blinking speed becomes faster approx. 5 sec. before recording begins. Then when recording starts, the lamp lights normally to indicate recording is in progress.

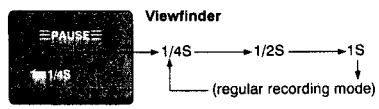
To release the Self-Timer mode:

When the tally lamp is not blinking:
Press INT. TIME continuously until "⏲" goes off.
When the tally lamp is blinking:
Press Start/Stop to stop the blinking, then press INT. TIME continuously until "⏲" goes off.

ANIMATION

The Animation function produces the illusion of movement in otherwise stationary scenes or objects. This technique is accomplished by shooting a series of slightly different pictures of the same scene or slightly different poses of the same object for a brief period of time.

1. Set SP/EP to "SP". (☞ P. 14)
2. Put the camcorder in the Record-Standby mode.
3. Press REC TIME to select the recording time.
   — The following sequence of time setting is displayed with each press of REC TIME:



4. Press START/STOP after focusing on the subject.
   - Recording stops automatically in the Record-Standby mode after the selected period of time.
5. Repeat steps 3–4 for the required number of pictures.
6. Playback the recorded series to check if results were satisfactory.

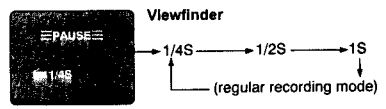
To release the Animation mode:
Press REC TIME until "🎥" in the viewfinder disappears.

- The Animation mode can only be engaged from the Record-Standby mode.

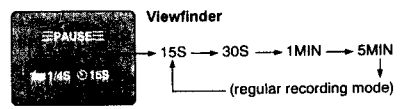
TIME-LAPSE

The Time-Lapse function allows automatic sequential on/off recording at preset time spans. With the camcorder continuously focused on a specific scene or object, the resulting recording will show subtle changes (such as shifts in cloud formations, plant growth etc.) over an extended period of time.

1. Set SP/EP to "SP". (☞ P. 14)
2. Put the camcorder into the Record-Standby mode.
3. Press REC TIME to select the recording time.
   — The following sequence of time settings is displayed with each press of REC TIME:



4. Press INT. TIME to select the interval time.
   — The following sequence of time settings is displayed with each press of INT. TIME:



5. Press START/STOP to start the Time-Lapse recording. The selected recording time and interval will alternate automatically.
   - The tally lamp functions in the same way as in Self-Timer shooting.

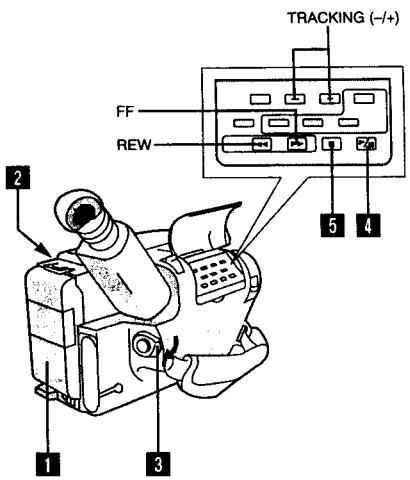
To release the Time-Lapse mode:

When the tally lamp is not blinking:
Press INT. TIME and REC TIME continuously until "🎥" and "⏲" go off.
When the tally lamp is blinking:
Press Start/Stop to stop the blinking, then press the INT. TIME and REC TIME continuously until "🎥" and "⏲" go off.

Notes and Advice

- Keep the camcorder steady in one position when filming the series of shots for best results. Mounting the camcorder on a tripod is recommended.
- Before recording in the Animation mode at the very beginning of a tape, set the camcorder to the Recording mode for about 5 seconds, so that the tape runs smoothly. Using the Fade-in function at this point is a good way to begin an animated program.
- Fade-in/out is not possible during Animation or Time-Lapse shooting.

PLAYBACK



The camcorder permits playback of recorded "VHS-C" video cassettes.
For connections refer to page 33.

PLAYBACK OPERATION

1. Preparations

1 Supply power. (Battery or AC operation: ☞ P. 9)
2 Insert a pre-recorded VHS-C cassette.
- Ensure that tape is not slack inside the cassette, then load the cassette correctly. ☞ P. 13.

2. To playback a cassette

3 Set the power switch to "PLAY".
— The power indicator lights.
4 Press PLAY/PAUSE.
— Playback starts and playback picture appears on the viewfinder screen and connected TV.

3. To stop playback

5 Press STOP.

REWIND OR FAST-FORWARD THE TAPE

To rewind the tape:
When in the stop mode, press REW.
To fast-forward the tape:
When in the stop mode, press FF.

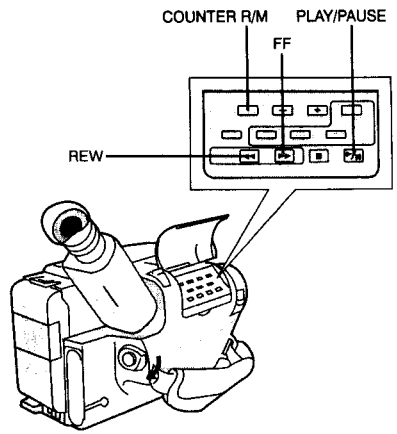
MANUAL TRACKING

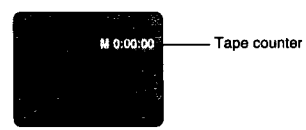
If noise bars appear on the screen, the tracking needs to be adjusted.

1 Press either TRACKING as many times to adjust to the best picture possible.
- To reset the tracking back to its standard preset, press both TRACKING (–/+) simultaneously.

Notes and Advice

- After about 5 minutes in Stop mode, the camcorder switches itself off automatically. (To turn on the camcorder again, set the power switch to "POWER OFF" first and then back to "PLAY".)
- The tracking adjustment may not be effective on tapes recorded on another VCR's or camcorders.





Viewfinder

STILL PLAYBACK

Press PLAY/PAUSE during playback.
- To resume normal playback, press PLAY/PAUSE again.

SHUTTLE SEARCH

Fast-speed forward playback:
Press FF during playback.
— Playback speed of the tape will be 3 times the normal speed in the SP mode, and 7 times in the EP mode.

Fast-speed reverse playback:
Press REW during playback.
— Reverse playback speed of the tape will be 3 times the normal speed in the SP mode, and 7 times in the EP mode.

COUNTER MEMORY FUNCTION

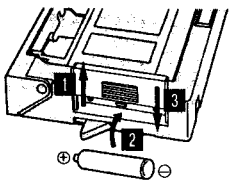
This camcorder incorporates a counter memory function which facilitates locating a specific tape segment.

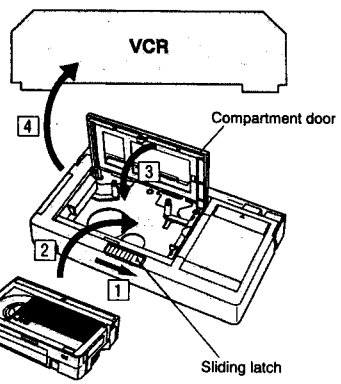
1 Press COUNTER R/M for more than 2 seconds.
— Resets the counter to "0:00:00".
2 Press COUNTER R/M for less than 1 second.
— "M" appears.
3 After recording or playback, press STOP, then REW.
— The tape will automatically stop at the counter reading of around "0:00:00".
4 Press PLAY/PAUSE. — Playback starts.

Notes and Advice

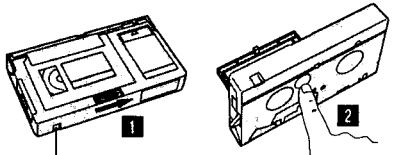
- For brief fast-speed searching, hold FF or REW for more than 2 seconds. When the button is released, the search ends and the tape will play.
- Noise bars will appear and pictures may become monochrome while in Still Playback or Shuttle Search. This is not due to any defect of the unit.
- To protect the tape and to conserve power, the camcorder will enter the stop mode and turn itself off after 5 minutes of still playback.
- The counter memory functions in the Fast-Forward and Rewind modes.
- To cancel the memory function, press COUNTER R/M so that the "M" disappears.

USING THE CASSETTE ADAPTER (VHS PLAYPAK)





Compact video cassette



Recording safety hole

By using the provided cassette adapter (VHS Playpak: C-P7U), a VHS video cassette recorded with this camcorder can be played back with any VHS video recorder. When the VHS-C video cassette is installed in the cassette adapter, it is fully compatible for both recording and playback on any VHS video recorder. The C-P7U cassette adapter is battery-powered and will automatically perform tape loading and unloading.

Inserting the battery into the cassette adapter

1. Remove the battery cover by sliding it up.
2. Install one "AA(R6)" size battery as shown.
3. Reattach the cover.

Playback on the VCR

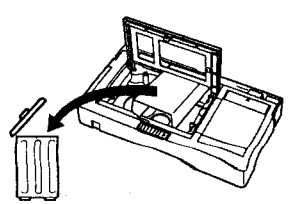
1. Open the compartment door by sliding the latch.
2. Insert the compact video cassette.
3. Close the compartment door. The tape is loaded.
4. Insert the cassette adapter into the VCR.
5. Playback the tape.

Removing the compact video cassette

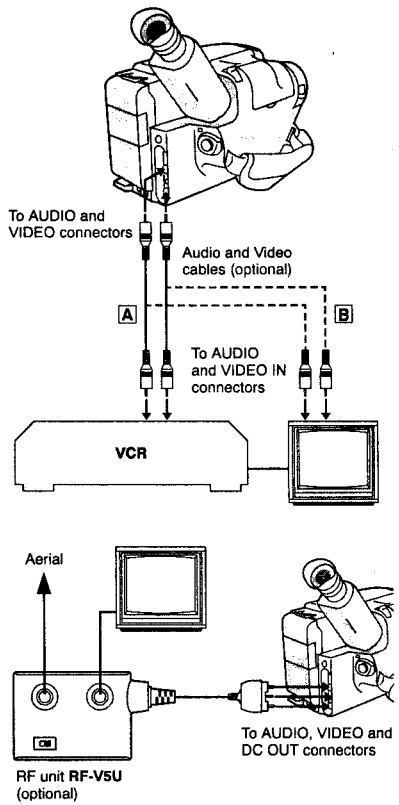
1. Slide the sliding latch.
   — The tape will be unloaded and the compartment door will open.
2. Insert your finger into the hole on the underside of the adapter, push the cassette up from below and remove it.

Notes and Advice

- Only compact video cassette tapes marked VHS-C can be used with the cassette adapter.
- During special-effect playback (slow motion, still frame, etc.), the picture may vibrate or noise bars may appear on the screen.
- When using the cassette adapter with a compact video cassette installed to record on a VCR, cover the recording safety hole using adhesive tape.
- *Please remove paper before using the C-P7U.*



CONNECTIONS



Also refer to the instruction manual for your VCR or TV when connecting the camcorder to them.

Connection to a VCR [A]

In this situation, use the Audio and Video cable.

1. Connect the camcorder and the VCR as shown in the diagram on the left.
2. Turn on the camcorder, the VCR and TV.
3. Set the VCR to AUX(iliary) input mode.
4. Set the TV to the VIDEO mode or channel 3.
   - Please refer to the instruction manual of your VCR.

Connection to a television equipped with A/V input connector [B]

In this situation, use the Audio and Video cable.

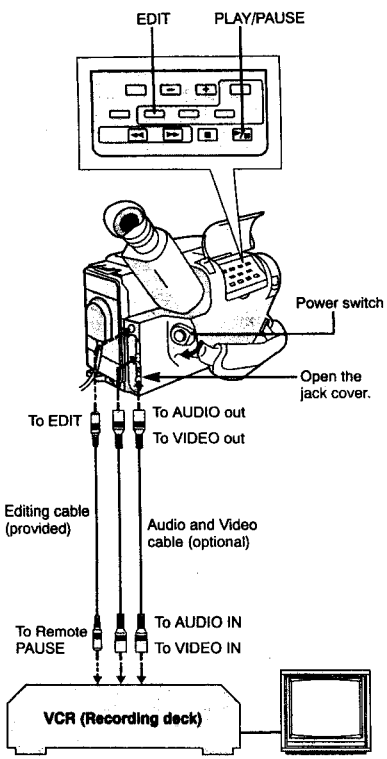
- Connect the AUDIO and VIDEO connectors of the camcorder to the A/V input connector of the television.
- Use the Video (or AV) mode specified in the TV's instruction manual. (instead of tuning to channel 3 or 4.)

Connection to a television not equipped with A/V input connector

In this situation, use the RF unit RF-V5U (optional). For connection and operation, please refer to the instruction manual for the RF-V5U.

Notes and Advice

- It is recommended to use the AC Power Adapter/Charger as the power supply rather than the battery pack.
- It is possible to monitor the picture and sound from the camcorder even when a cassette tape is not loaded. Set the power switch to "CAMERA". When you select the television input from your camcorder, the audio and video can be monitored.
- Some speakers and televisions are specially shielded to prevent television interference. If neither is shielded, do not place the speakers adjacent to the television, otherwise the video playback picture will have interference.



TAPE DUBBING

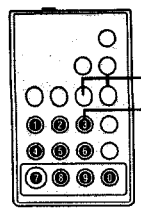
Preparations

- Connect the camcorder and the VCR as shown in the diagram on the left.
  - —The editing cable is used to connect the camcorder and a JVC VCR with a Remote PAUSE terminal.*
    (If the VCR does not have a Remote PAUSE jack, you can use the R.A. EDIT jack if one is available. See additional notes on Dubbing using the editing cable below.)
- Set the power switch to "PLAY".
- Turn on the VCR.
- Correctly insert the appropriate cassettes into the camcorder and the VCR.

1. Engage the VCR's AUX(iliary) mode and Record-Pause mode.
2. Engage the camcorder's play mode to locate a position on the tape slightly before edit-in point. When this point is reached, press PAUSE to enter the still mode.
3. Press the camcorder's EDIT and set the VCR's recording mode to start editing.
   —The camcorder rolls back the tape a little before it starts playback.
4. When the tape reaches the edit-out point, put the VCR's Record-Pause mode and the camcorder's still mode.
   - Repeat steps 2 – 4.
   - Stop both the camcorder and the VCR when dubbing is finished.

Notes and Advice

- ***Dubbing using the editing cable to connect the camcorder and the JVC VCR with a Remote PAUSE terminal**
  - — When the camcorder's EDIT is pressed at step 3, the VCR automatically starts recording. When the camcorder's PLAY/PAUSE is pressed, the VCR automatically enters the Record-Pause mode.
  - — Reset the camcorder's counter in advance to "M0:00:00" at an edit-out point. When the tape reaches the point (counter reading of 0:00:00) during dubbing, the camcorder enters the Still mode and the VCR enters the Record-Pause mode automatically. This function is called "Master Edit Control System".
- There are some VCRs which are not compatible with the Master Edit Control system.
- When the tape reaches the preset edit-out point (M0:00:00)during the dubbing operation, it may stop slightly before or after the designated point on the tape.



MBR:
RM-V706U
(provided with GR-AX900) or
RM-V700U (optional)

VCR CODE LIST

VCR BRAND NAME	BUTTONS (A) (B)
GE	1 1 5 2 5 0 3 4
HITACHI	6 6 6 3
JVC A B C	3 1 3 6 3 3
MAGNAVOX	3 5 1 1 7 1 7 6
MITSUBISHI	5 7 6 3
NEC	3 7 3 3
PHILIPS	1 3 3 6 1 1 5 4 3 1 3 6 1 2 3 3

VCR BRAND NAME	BUTTONS (A) (B)
PANASONIC	1 3 1 7 1 1 5 4 1 6
RCA	5 2 5 4 6 6 5 3 5 0
SANYO	3 6 3 5
SHARP	1 5 1 0
SONY	6 5 6 0 3 5 3 1
TOSHIBA	6 3 6 1
ZENITH	1 6

RANDOM ASSEMBLE EDITING (R.A.Edit)

This function makes it easier to create edited videos when your camcorder is used as the source player in combination with your VCR. You can pre-select up to 8 scenes or "cuts" for automatic editing in the sequence you have specified. Random Assemble Editing can be more conveniently done if the MBR (Multi Brand Remote) has been set to correspond to the brand of your VCR.

1 How to set the remote control unit to correspond to the brand of your VCR:

Turn the VCR's power off before starting.

1. Point the remote control toward the VCR's infrared beam sensor window.
2. Refer to the list on the left, and while pressing MBR SET, press button (A), then press button (B).
3. Release MBR SET.
   - The code is set and the VCR's power automatically comes on.
     If your VCR's power does not come on, try another code from the table on the left.
     (With some VCR brands, power won't come on automatically. In this case, turn the VCR power on manually and check to see if the remote control buttons work with the VCR.)

2 How to operate the VCR:

1. Turn the VCR's power ON.
2. Press the button on the remote control unit corresponding to the function you want to operate while pressing VCR CTL.

(Continued on next page.)

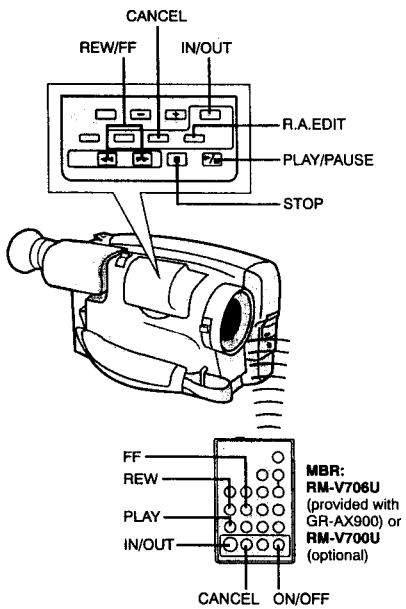
Notes and Advice

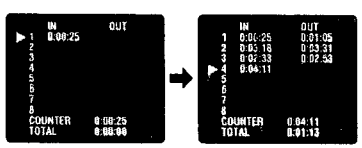
- Since the remote control unit has a number of operation codes, determine the appropriate code for operating your VCR by confirming correct VCR operations according to the steps above.
- The VCR functions that the MBR can control are PLAY, STOP, PAUSE, FF, REW and VCR REC STBY. Among them, VCR REC STBY button doesn't need to be pressed along with VCR CTL.
- If the MBR is not able to control the VCR, use the controls on the VCR.

IMPORTANT

- Although the MBR (Multi-Brand Remote Control) is compatible with JVC VCRs, as well as many VCR models manufactured by others, it is possible that this remote control will not work with your VCR or may offer limited functions.

EDITING TECHNIQUES (Cont'd)





Preparations

- Connect the camcorder and the recording deck as per the diagram on the right (P. 37).

[A]: If the recording deck is a JVC VCR that has a Remote PAUSE terminal, connect the Editing cable to it. (If the VCR does not have a Remote PAUSE terminal, connect to the R.A.EDIT connector.)

[B]: If the VCR has neither a Remote PAUSE nor an R.A.EDIT connector, connect the Editing cable to the MBR's Pause-In jack.

- Camcorder: Correctly insert a recorded tape and set the power switch to "PLAY".
- VCR: Turn power on. Insert a recordable tape, and set to the AUX (iliary) mode. Refer to VCR's manual for details.

To select up to 8 scenes

1. Press PLAY/PAUSE.
2. Press R. A. EDIT.
   - The R. A. Edit counter display will appear in the viewfinder and on the TV screen.
3. Use FF or REW to search for the beginning of a scene you want, press IN/OUT.
   - The in-point's counter reading is registered on the display.
4. Use FF or REW to search for the end of the scene you want, press IN/OUT again.
   - The out-point's counter reading is registered on the display.
   - The "TOTAL" reading shows the total running time of the edited scenes.
5. Specify additional scenes by repeating steps 3 – 4.

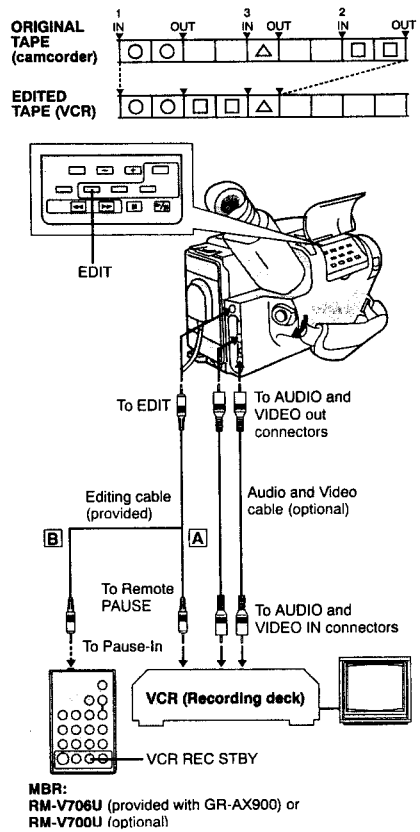
The MBR can also be used for the following:

- ON/OFF functions same as R.A.EDIT of the camcorder
- IN/OUT functions same as IN/OUT of the camcorder
- CANCEL functions same as CANCEL of the camcorder

Notes and Advice

- For any scene, the out-point must have a counter reading that is at least 1 second after the in-point. An out-point with a counter reading less than or the same as the in-point will not be registered.
- Since the camcorder prerolls during R.A. Edit, there must be at least 15 seconds worth of recording material prior to any in-point on the playback tape.
- Blank portions of tape cannot be registered as in- or out-points.
- If the search time for an in-point exceeds 5 minutes, the recording deck's Record-Pause mode will be cancelled and editing will not take place.
- Pressing the R.A. EDIT (ON/OFF) button will clear all in- and out-points from memory.
- When editing, a slight discrepancy between the counter reading and actual in- and out-points may occur. Please *position your in- and out-points with enough leeway so that segments will be recorded* in their entirety (not cut off).

(Continued on next page.)



To make corrections

During steps 3 and 4 on the previous page, pressing CANCEL will erase the last in- or out-point. Pressing again will erase the point before that, and so on.

For automatic editing: VCR

1. Put the VCR in the Record-Pause mode.
   MBR can also be used.
   - Point the remote control toward the VCR's infrared sensor window and press VCR REC STBY.
   - Be sure that the VCR enters the Record-Pause mode. If not, use the controls on the VCR to enter the Record-Pause mode.

   Note:
   With some manufacturer's VCR's, pressing VCR REC STBY may not place the VCR into the Record-Pause mode.
2. Press the camcorder's EDIT.
   - The function begins automatic editing; all the scenes are copied to the VCR in the specified order.
   - Keep the remote control pointed toward the VCR's remote sensor window. (in case of [B])
   - The on-screen display remains superimposed while the camcorder searches for each scene (the blinking cursor points to the scene number presently being searched), and is not displayed while the scenes are being edited.
   - When R. A. Edit is finished, the camcorder enters the Still mode and the VCR enters the Record-Pause mode. Press STOP on both units to end R. A. Edit.

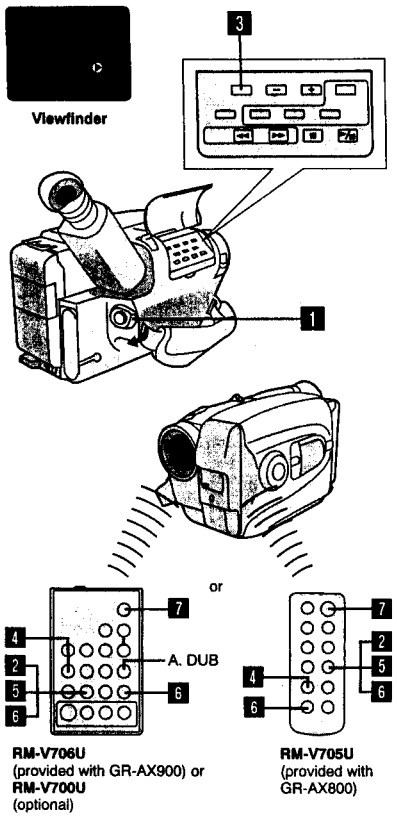
Making the duplicate without any edits

To make a duplicate copy of the camcorder's tape, perform R. A. Edit by specifying only one in-point (and no out-point). R. A. Edit will automatically dub everything from that in-point to the end of the tape.

Notes and Advice

- With some VCR models, there may be noise at the in- or out-points on the edited tape.

EDITING TECHNIQUES (Cont'd)



RM-V706U
(provided with GR-AX900) or
RM-V700U
(optional)

RM-V705U
(provided with
GR-AX800)

INSERT EDITING

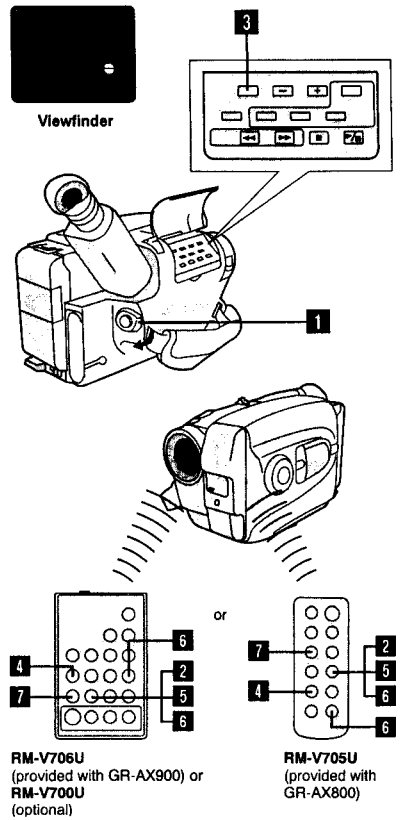
Insert Editing means recording a new scene into a section of prerecorded tape so that a part of the original recording can be replaced with a new sequence without excessive picture distortion at the edit-in and edit-out points. In the Insert Editing mode, the original audio on the audio track remains unchanged.

1. Set the power switch to "PLAY".
2. Locate the desired edit-out point on the tape and press PAUSE.
3. Press COUNTER R/M for more than 2 seconds to reset the tape counter, then press it once again for less than 1 second to make "M" appear in the viewfinder.
4. Press REW to rewind the tape a little beyond the beginning of the scene you wish to insert.
5. Press PAUSE exactly at the beginning of the scene to insert.
6. While holding INSERT pressed, press PAUSE.
   — The camcorder enters the Insert Editing mode with the scene at which the camcorder is aimed appearing on the screen for monitoring.
7. Press START/STOP to insert the new sequence.

■ When the counter reading of "0:00:00" is reached, Insert Editing stops automatically and the camcorder enters the Playback mode.

Notes and Advice

- If the tape has a blank segment or a point where the recording mode (SP/EP) has been switched, Insert Editing may not function properly.
- When in the Still mode, the counter indication may be blurred. This is normal.
- When the tape reaches the preset edit-out point during the editing operation, it may stop slightly before or after the designated point on the tape. Also, at that time, noise bars may appear momentarily. Neither of these is a defect of the unit.
- Only video signal is recorded in the Insert Editing mode. When the sound is to be recorded, press A. DUB and PAUSE simultaneously in the Insert Pause mode. When INSERT and PAUSE are pressed simultaneously again, the unit re-enters the Video-signal-only Recording mode.
- Tapes with their safety tabs removed cannot be Insert-Edited. Reseal the safety tab slot to perform the dubbing.
- If whistling or howling is heard during Insert Editing, reduce the TV volume or move the mike farther away from the TV.



RM-V706U
(provided with GR-AX900) or
RM-V700U
(optional)

RM-V705U
(provided with
GR-AX800)

AUDIO DUBBING

Audio Dubbing means recording a new soundtrack on a pre-recorded tape, i.e., replacing the original sound with new audio material.

Audio Dubbing is applicable only to the longtudial audio track (normal audio).

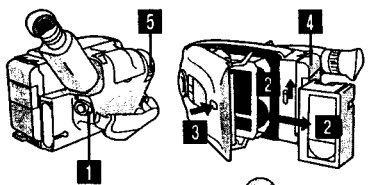
1. Set the power switch to "PLAY".
2. Locate the desired edit-out point on the tape and press PAUSE.
3. Press COUNTER R/M for more than 2 seconds to reset the tape counter, then press it once again for less than 1 second to make "M" appear in the viewfinder.
4. Press REW to rewind the tape a little beyond the beginning of the scene you wish to dub audio.
5. Press PAUSE exactly at the beginning of the scene.
6. While pressing A.DUB, press PAUSE to enter the Audio Dub Standby mode.
7. Press PLAY. — Audio Dubbing begins.

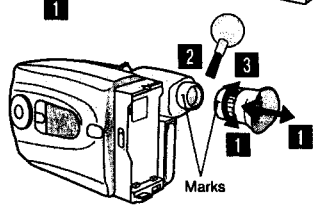
■ When the counter reading of "0:00:00" is reached, Audio Dubbing stops automatically and the camcorder enters the Playback mode.

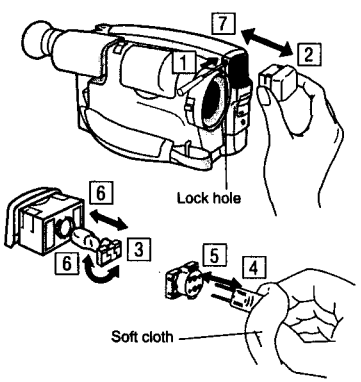
Notes and Advice

- If the tape has a blank segment or a point where the recording mode (SP/EP) has been switched, Audio Dubbing may not function properly.
- Tapes with their safety tabs removed cannot be Audio-Dubbed. Reseal the safety tab slot to perform the dubbing.
- If whistling or howling is heard during audio dubbing, reduce the TV volume or move the mike farther away from the TV.
- If the camcorder is connected to the TV, noise may appear on the screen during the Audio Dubbing procedure. This phenomenon is not recorded on the tape.

AFTER USE







1. Set the power switch to "POWER OFF" to turn power off.
2. Slide EJECT to open the cassette holder, then remove the cassette.
3. Close and lock the cassette holder by pressing PUSH.
4. Press BATT. RELEASE to remove the battery pack.
5. Slide the LENS COVER open/close switch to close the lens cover.

HOW TO CLEAN THE CAMCORDER

When the camcorder's exterior is dusty, clean by gently wiping with a soft cloth.

HOW TO CLEAN THE LENS

When the lens is dirty or dusty, blow it with a blower brush and then gently wipe with lens cleaning paper.

HOW TO CLEAN THE VIEWFINDER

The viewfinder eyepiece can be removed for cleaning.

1. Turn the eyepiece counterclockwise and pull it out.
2. Remove dust with a blower brush.
3. Align the marks, reattach the eyepiece and turn it clockwise.

HOW TO REPLACE THE VIDEO LIGHT BULB

It is recommended to consult your nearest JVC dealer for replacing the bulb. However, if you wish to do it yourself, proceed as follows:

1. Insert a flat and narrow object into the lock hole.
2. Pull out the video light unit.
3. Turn the bulb unit counterclockwise to remove it.
4. Pull out the bulb.
5. Insert a new bulb. At this time it is important to hold the bulb using a soft cloth. Do not touch the bulb directly.
6. Replace the bulb unit.
7. Reattach the video light unit.

Notes and Advice

- Avoid using of strong cleaning agents such as benzine or alcohol as they may damage the exterior.
- The video light unit and the bulb are very hot immediately after the power is turned off. Bulb replacement should be performed after it has cooled. (It will take approx. 30 minutes to cool sufficiently.)
- Do not touch the bulb directly. If it is becomes dirty, smoke or reduced service life may result. When accidentally touched by your fingers, wipe it with a soft cloth.
- Give the part number YQ20645-001 when ordering a video light bulb.
- Use the exclusive halogen bulb which is available at your nearest JVC dealer.

HELPFUL TERMS AND INFORMATION

The following glossary is for your convenience in helping you better understand your camcorder and its operation.

Animation: (☞ P. 29)
By shooting the same inanimate subject repeatedly with slight variations each time, the illusion of motion can be created.

Audio dubbing: (☞ P. 39)
Allows you to replace only the linear audio portion in a previously recorded scene (for adding narration, etc.).

Auto Gain Control: (☞ P. 20)
Automatically increases camera sensitivity when the illumination falls below a certain level.

Auto Pause System: (☞ P. 17)
Prevents shooting unnecessary scenes by mistake when the camcorder is pointed straight down (i.e., the ground, feet).

AUX mode: (☞ P. 33, 34, 36)
Refers to Auxiliary mode. When the camcorder is connected to a VCR for editing or dubbing, the VCR should be set to this mode.

AV:
Short for Audio/Video. Often refers to the audio (sound) and video (picture) signals which, when combined, make up a program.

CCD (Charge Coupled Device):
Solid-state imaging device used in camcorders as the camera's image pickup; analogous to the eye's retina except that picture information is output as electric signals.

Cinema mode: (☞ P. 23)
"Letterboxes" live recordings (blacks out the top and bottom of the screen) to give scenes recorded on a camcorder a "wide screen" effect.

Color temperature:
A measurement in Kelvin degrees which indicates the color contents of a light source; bluish light has a higher color temperature than reddish light. To reproduce white as white under different types of lighting, the chrominance signal must be adjusted to match the light source's color temperature. (See "White balance".)

Head:
An electronic component which "writes" or "reads" video and audio signals on the tape.

HQ (High Quality):
An enhancement feature in the VCR circuitry which provides greater picture detail.

Lithium battery: (☞ P. 8, 12)
Necessary for camcorder's clock and date/time/character settings, and for use of the RM-V700U/RM-V705U/RM-V706U Remote Control Unit. Use only CR2025.

Master Edit Control: (☞ P. 34)
Lets a camcorder control the starting and stopping of a VCR during editing for accurate, synchronized editing at the touch of a single button.

On-screen display: (☞ P. 26)
The viewfinder indications can also be displayed on the screen of a monitor or TV that's connected to the camcorder.

Program AE with Special Effects: (☞ P. 20)
A variety of creative shooting effects are accessible.

Quick review: (☞ P. 17)
Permits reviewing of the final part of the last recorded segment in the Record-Standby mode.

R.A.Edit (Random Assemble Editing): (☞ P. 35)
This feature lets you pre-select up to 8 scenes to be automatically rearranged and edited to a connected VCR.

Refresh: (☞ P. 10)
A feature on the AC power adapter that lets you completely discharge the power from the battery pack before charging again. Contributes to longer battery life.

Retake: (☞ P. 17)
Permits forward or reverse search in the Record-Pause mode for easy re-recording.

Self-timer: (☞ P. 20, 28)
Enables a camcorder to automatically start recording after a selected delay time so the operator can enter the picture before actual recording begins.

Time-lapse: (☞ P. 29)
Permits automatic on/off sequential recording at preset intervals. Used to capture changes over long periods of time.

Tracking: (☞ P. 30)
A mechanism enabling the tracking position to be adjusted during playback so that the heads can accurately pick up the recorded signal in the best condition.

Tally lamp: (☞ P. 16, 28)
Lights to show that recording is in progress.

VCR: (☞ P. 33, 34, 36)
Short for Video Cassette Recorder.

White balance: (☞ P. 22)
A term that refers to the correctness of color reproduction under various lighting. If the white balance is correct, all other colors will also be accurately reproduced.

CAUTIONS

For safety, strictly observe the following instructions.

- Do not open the camcorder's chassis.
- Prevent inflammables, water and metallic objects from entering the unit.
- Do not disassemble or modify the unit.
- Do not use the unit when there is lightning in the vicinity. Disconnect the power cable of connected equipment.
- Do not short-circuit the terminals of the battery packs. When carrying a battery pack, keep it away from metallic objects (key holder, necklace, etc.) by putting it in a vinyl bag, etc. This can prevent accidents.

Avoid using the unit under the following conditions:

- Places subject to excessive humidity or dust.
- Near appliances generating strong magnetic or electric fields (speakers, broadcasting antennas, etc.).
- Places subject to soot or steam such as near a cooking stove.
- Places subject to excessive shock or vibration.
- Near a television set (rolling pictures or howling might result).
- Extremely hot places.

Do not expose the unit to high temperatures over 40°C (104°F) for long periods.

If the unit should be subjected to direct sunlight, or left in a closed car in summer, or placed near a heater, the CCD and the auto-focus sensor may deteriorate and the cabinet may become deformed. Furthermore, this also may cause the transistors and other electronic and mechanical parts to malfunction. Remember the following:

- Do not leave the unit in places of over 50°C (122°F).
- Do not use the unit in places of over 40°C (104°F).
- Do not use the unit in places of below 0°C (32°F).
- Protect the unit from excessively dry or humid conditions (below 35% or above 80% humidity).
- For long storage, select a place between –20°C (–4°F) and 30°C (86°F).

Be careful when using the video light.

- The video light becomes extremely hot. Do not touch it either while in operation or soon after turning it off, otherwise serious injury may result.
- Do not place the camcorder into the carrying case immediately after using the video light, since it remains extremely hot.
- When operating, keep a distance of about 30 cm (1 ft.) between the video light and people or object.
- Do not us e near flammable or explosive materials.

Take special care for protection of the unit.

- Do not allow the unit to become wet.
- Do not leave the unit in closed cars on hot summer days.
- Take special care not to drop the unit or strike it against hard objects. Protect from shocks during transportation.

Make it a rule to observe the following instructions.

- Do not remove the battery pack or disconnect other power supply units while the power is on. If not observed, this will cause tape damage and missoperation.
- When the unit is not in use, remove the battery pack.

Keep the lens and viewfinder eyepiece always clean.

- When the lens is dirty or dusty, blow it off first and then gently wipe with a soft brush or lens cleaning paper.
- Mold may form if the lens is left dirty.

Be careful not to damage the CCD.

- Do not keep the lens directed at extremely bright objects such as the sun or other light sources for long periods. Although the CCD is less susceptible to such burn than a tube would be, caution should be exercised when using this unit. Most importantly, the lens should be capped except while actually shooting.
- Do not direct the eyepiece of the viewfinder at the sun.

Handle the unit carefully.

- Protect the microphone from excessive shocks.
- Do not carry the unit by holding it only by the viewfinder.
- Avoid undue strain on the camcorder's shoulder strap, such as unnecessarily swinging the camcorder.

Moisture condensation.

- You have observed that pouring a cold liquid into a glass will cause drops of water to form on the glass's outer surface. This same phenomenon occurs on the head drum of a camcorder when it is moved from a cool place to a warm place, after heating a cold room, under extremely humid conditions or in a place directly subjected to the cool air from an air conditioner.
- Moisture on the head drum can cause severe damage to the video tape, and can lead to internal damage to the camcorder itself.
- If moisture condensation occurs on the head drum, a condensation warning appears in the viewfinder and the unit enters the Stop mode, unable to function. In such a case, turn off the unit, and leave it for a few hours. Then set the power switch to "CAMERA" or "PLAY". A few minutes later, the warning should disappear.

Maintenance

- When the cabinet is dusty, clean by gently wiping with a soft cloth.
- Avoid the use of strong cleaning agents such as benzine or alcohol as they may damage the cabinet.
- Cleaning should be done only after the battery pack has been removed or other power units have been disconnected.

Serious malfunctioning

If malfunctioning occurs, stop using the unit immediately and consult your local JVC dealer.

General Battery Precautions

- When the RM-V20U/C-P6U/C-P7U is not functioning even when correctly operated, the batteries are exhausted. Replace them with fresh batteries.
- Use only following batteries in the unit.
  RM-V20U .....AAA (R03) size
  C-P6U/C-P7U .....AA (R6) size

Please make note of the following rules for battery use. When misused, batteries can leak or explode.

1. Insert the batteries correctly according to the diagram inside the battery section.
2. Do not use old and new batteries together.
3. Do not use two different kinds of batteries. Although sizes may be the same, voltages may differ.
4. Do not expose batteries to excessive heat as they can leak, or explode. Do not dispose of batteries in a fire.
5. Remove batteries from the unit if it is to be stored for an extended period to avoid battery leakage which can cause malfunctions.

IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first.....

Symptoms	Check points
Power	
No power is supplied.	■ Is the battery pack correctly installed? ☞ P. 9. ■ Is the battery pack charged? ☞ P. 10. ■ Is the power supply unit correctly connected? ☞ P. 9.
Recording	
Recording is impossible.	■ Check to see if the cassette safety tab is in place. ☞ P. 13.
Recording does not start.	■ Have you set the power switch to "CAMERA" first? ☞ P. 16.
Playback	
Tape is running, but no playback picture appears.	■ Is the TV receiver set to your video channel? ■ If A/V connection is used, is the TV's VIDEO/TV switch set to VIDEO? ■ Is the RF unit set to the correct channel?
Noise bars appear in the playback picture.	■ Use TRACKING to reduce noise bars. ☞ P. 30.
Playback picture is blurred or interrupted.	■ Video heads may be dirty or worn out. For head cleaning or replacement, consult the nearest JVC Service Dealer.
Tape transport	
Tape stops during fast forward or rewind.	■ Is the "M" indication visible in the viewfinder? If so, press COUNTER R/M to cancel the memory function. ☞ P. 31.
Rewinding or fast forwarding is impossible.	■ Check to see if the tape has already been fully wound on one reel or the other.
Other	
Some functions are not available.	■ The Intelligent Function Control (☞ P. 23) and MWB (☞ P. 22) are unavailable when the PROGRAM AE select dial is set to "LOCK".
Vertical white lines appear when shooting a very bright object.	■ This may occur when the background contrasts very much with the object. This is normal.
Crystal-shaped bright spots appear in the viewfinder.	■ Is the sun located in front or off to a slight angle from the front of the lens? Avoid letting sunlight directly into the lens by changing the camcorder's position, zooming in or out slightly, shading the lens with your hand, etc.
Picture is blurred in the Quick Review or Retake mode.	■ Is SP/EP properly set? ☞ P. 14.
Error number (E01, etc.) appears in the viewfinder.	■ Consult your nearest JVC Service dealer.

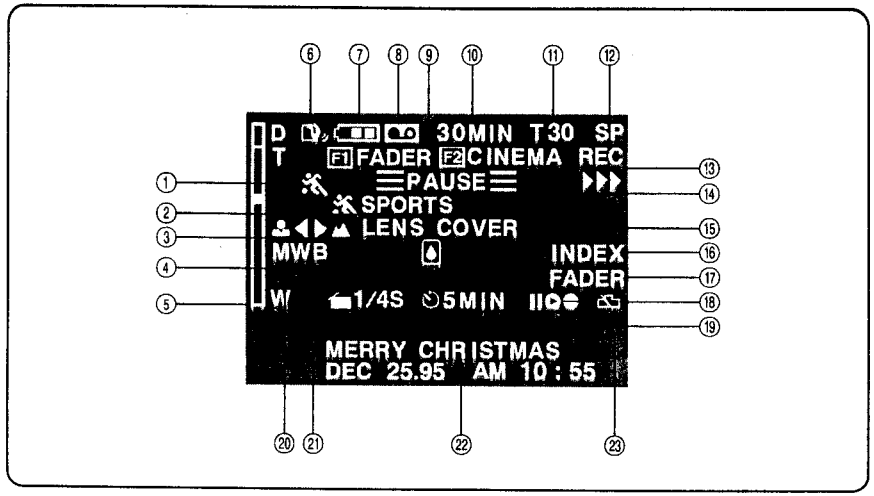
The camcorder is a microcomputer-controlled device. External noise and interference (from a TV, a radio, etc.) might prevent it from functioning properly. In such cases, first disconnect its power supply unit (battery pack, AC Power Adapter/Battery Charger, etc.) and clock battery; and then reconnect it and proceed as usual from the beginning.

Special note on head cleaning

Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Although this camcorder is equipped with a built-in head cleaner which automatically cleans the heads, reducing the likelihood of dirty heads, if such troubles are encountered, please consult your nearest JVC dealer.

■ A built-in head cleaner automatically cleans the video heads and head drum whenever a cassette is loaded and unloaded to reduce head clogging.

VIEWFINDER INDICATIONS



①, ② **PROGRAM AE indicator** (☞ P. 20)
Displayed at ② for approx. 3 seconds when the PROGRAM AE select dial is switched from one position to another. Then only the indicator remains at ①.

③ **Focus indicator** (☞ P. 24, 25)

④ **White balance mode indicator** (☞ P. 22)

⑤ **Zoom level indicator** (☞ P. 18) / **Exposure indicator bar** (☞ P. 25)

⑥ **Digital Image Stabilizer indicator** (☞ P. 18)

⑦ **Remaining battery power indicator**
Changes as follows according to the remaining power level:
When the battery power is coming to an end, a battery indicator ( ) blinks in the viewfinder. After indication blinks, the power turns off automatically. Replace the battery pack with a fully charged one. (☞ P. 9, 10)

⑧ **Cassette warning**
Blinks to warn that no cassette without safety tab is loaded.

⑨ **Intelligent function control indicator** (☞ P. 23 – 27)

⑩ **Remaining tape time** (☞ P. 14)

⑪ **Tape length indicator** (☞ P. 14)

⑫ **SP/EP Recording mode indicator** (☞ P. 14)

⑬ **Recording indicator** (☞ P. 16)

⑭ **Recording-Standby indicator:**
=PAUSE= (☞ P. 16)
Auto Pause indicator:
AUTO PAUSE (☞ P. 17)

⑮ **Lens cover warning**
Blinks for approx. 5 seconds, whether the lens cover is open or closed, everytime the unit is turned on. Lets the user check to see if the cover is open.

⑯ **Index Code Marking** (☞ P. 18)

⑰ **Fade-Standby indicator** (☞ P. 23)

⑱ **Clock battery warning**
Blinks when the clock (lithium) battery is not in place or exhausted. In this condition, no date/time function is available. (For inserting or replacing the clock battery, ☞ P. 12)

⑲ **Insert Editing/Audio Dubbing indicators** (☞ P. 38, 39)

⑳ **Condensation warning**
Blinks when moisture condensation occurs on the head drum. While the indication is in the viewfinder, the unit's functions come to a halt. Turn off the unit and leave it for a few hours. Then turn on the unit. A few minutes later, the warning should disappear.

㉑ **Instant title** (☞ P. 27)

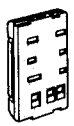
㉒ **Date/Time/Character** (☞ P. 26, 27)

㉓ **Interval time/Recording time indicator**
For Self-Timer, Animation and Time-Lapse functions (☞ P. 21, 28, 29)

SYSTEMS FLEXIBILITY

For maximum enjoyment, make the most of the provided or optional accessories depending on the situation.

■ **Battery pack**
BN-V12U
BN-V22U
BN-V60U
BN-V25U

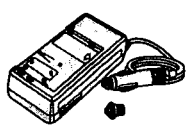


*Recording time ☞ P. 9

■ **AC Power Adapter/Battery Charger AA-V11U**
Charges or discharges battery pack or powers the camcorder via household AC current. (Can be used with 110 V to 240 V.)

*Charging time ☞ P. 10

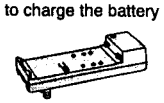
■ **Car battery charger BH-V3U**
Charges battery pack or powers the camcorder via a car battery. (Use with 12 V or 24 V nagative grounded cars only.)



*Charging time

BN-V12U	Approx. 50 min.
BN-V22U	Approx. 90 min.
BN-V25U	Approx. 120 min.
BN-V60U	Approx. 90 min.

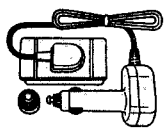
■ **Battery charger BH-VC10U**
Use to charge the battery pack.



*Charging time

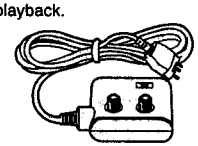
BN-V12U	Approx. 7 hours
BN-V22U	Approx. 13 hours
BN-V25U	Approx. 17 hours
BN-V60U	Approx. 13 hours

■ **Car battery cord AP-V7U**
Power the camcorder via a car battery. (Use with 12 V negative grounded cars only.)



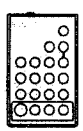
*Cable length: 2 m (6.6 ft.)

■ **RF unit RF-V5U**
Use to connect the camcorder to a regular television for playback.

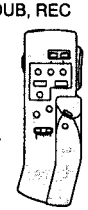


*Cable length: 1.5 m (5 ft.)

■ **Wireless remote control unit RM-V700U**



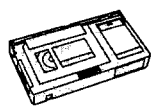
■ **Wired remote control unit RM-V20U**
Controls the camcorder's functions (POWER ON/OFF, REW, FF, STOP, PLAY, PAUSE, INSERT, AUDIO DUB, REC TIME, INTERVAL, VISS, START/STOP, ZOOM T/W) from a distance, and from any direction.



*Cable length: 3 m (9.9 ft.)

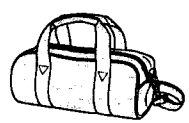
■ **Compact VHS (VHS-C) cassettes TC-40/30/20**
Allows 40/30/20 minutes of VHS recording and playback respectively.

■ **Cassette adapter (VHS Playpak) C-P6U/C-P7U**
Enables the VHS-C cassette to be used with regular VHS machines.



■ **Conversion lens kit GL-V10U**
Offers telephoto (1.4x) and wide-angle (0.6x) conversion.

■ **Active carrying bag CB-V7U**



*Dimensions (WxHxD):
340 x 170 x 155 mm
(13-7/16" x 6-3/4" x 6-1/8")

Some accessories are not available in some areas. Please consult your nearest JVC dealer before purchasing optional accessories.

FOR SERVICING

HOW TO LOCATE YOUR JVC SERVICE CENTER

TOLL FREE: 1-800-252-5722

Dear customer:
In order to receive the most satisfaction from your purchase, read the instruction booklet before operating the unit. In the event that repair is necessary, or for the address nearest your location, please refer to the factory service center list below or within the Continental United States, call 1-800-252-5722 for your authorized servicer. Remember to retain your Bill of Sale for Warranty Service.

— JVC

JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF US JVC CORP.

FACTORY SERVICE CENTER LOCATIONS

107 Little Falls Road
Fairfield, NJ 07004-2105
(201) 808-9279

1500 Lakes Parkway
Lawrenceville, GA 30243-5357
(404) 339-2522

705 Enterprise Street
Aurora, IL 60504-8149
(708) 851-7855

5665 Corporate Avenue
Cypress, CA 90630-0024
(714) 229-8011

10700 Hammerly, Suite 110
Houston, TX 77043
(713) 935-9331

2969 Mapunapuna Place
Honolulu, HI 96819-2040
(808) 833-5828

230 Eliot Street
Ashland, MA 01721-2377
(508) 881-5923

14505 Commerce Way
Miami Lakes, FL 33016-1512
(305) 362-6252

890 Dubuque Avenue
South San Francisco, CA 94080-1804
(415) 871-2666

Sophisticated electronic products may require occasional service. Just as quality is a keyword in the engineering and production of the wide array of JVC products, service is the key to maintaining the high level performance for which JVC is world famous. The JVC service and engineering organization stands behind our products.

NATIONAL HEADQUARTERS
JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF US JVC CORP.
107 Little Falls Road
Fairfield, NJ 07004-2105

If you ship the product...

Pack your JVC unit in the original carton or one of equivalent size and strength. Enclose, with the unit, a letter stating the problem or symptom that exists and also a copy of the receipt or bill of sale you received when you purchased your JVC unit. Print your home return address on the outside and the inside of the carton. Send to the appropriate JVC Factory Service Center as listed above.

Don't service it yourself.

CAUTION

To prevent electrical shock, do not open the cabinet. No user serviceable parts inside.
Refer servicing to qualified service personnel.

ACCESSORIES

To purchase accessories for your JVC product, you may contact your local JVC Dealer. Or from the 48 Continental United States call toll free: 1-800-882-2345.